

# **Depression-related presenteeism: Identifying the correlates, estimating the consequences, and valuing associated lost productive time.**

by

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Submitted in fulfilment of the requirements for the degree of  
Doctor of Philosophy



Menzies Research Institute Tasmania  
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## **Declaration of originality**

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This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by any other person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

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## Statement of authorship

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This thesis includes papers for which Fiona Cocker (FC) was not the sole author. FC conceptualised the papers, analysed the data and wrote the manuscripts, and where relevant, participated in data collection. The contributions of FC and co-authors are detailed below.

1. The paper reported in Chapter 3:

Cocker F, Martin A, Scott J, Venn A, Otahal P, Sanderson K. Factors associated with presenteeism amongst employed Australian adults reporting lifetime major depression with 12-month symptoms. *Journal of Affective Disorders*, 2011; 135, 231-40.

The contribution of each author:

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PO advised on data analysis and interpretation.

KS assisted in conceptualising the paper, helped with analyses and interpretation of the results and revised the manuscript.

AM helped with interpretation of the results and revised the manuscript.

JS helped with interpretation of the results and revised the manuscript.

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2. The paper reported in Chapter 4:

Cocker F, Martin A, Scott J, Sanderson K. The antecedents and consequences of depression in small-to-medium enterprise owner/managers: A review and future research agenda. Submitted to *International Journal of Mental Health Promotion*, July 2012.

The contribution of each author:

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AM helped revise the manuscript.

JS helped revise the manuscript.

KS helped revise the manuscript.

3. The paper reported in Chapter 5:

Cocker F, Martin A, Venn A, Scott J, Sanderson K. Psychological distress and work attendance behaviour amongst small-to-medium enterprise (SME) owner/managers. Submitted to European Journal of Work and Organisational Psychology, December 2012.

The contribution of each author:

FC conceptualised the paper, participated in data collection, data management and cleaning, and comprised the initial draft of the manuscript. With the advice of PO she undertook all the analyses and interpretation of the data, and completed revisions.

AM helped with interpretation of the results and revised the manuscript.

KS helped with interpretation of the results and revised the manuscript.

JS and AV helped with interpretation of the results and revised the manuscript.

4. The manuscript reported in Chapter 6:

Cocker F, Martin A, Scott J, Venn A, Graves N, Nicholson J, Oldenburg B, Palmer A, Sanderson K. Beyond dollar outcomes: Comparing the costs and health outcomes of depression-related work attendance behaviours.

The contribution of each author:

FC conceptualised the paper, collated the data, analysed and interpreted the data and wrote the manuscript.

KS assisted in conceptualisation of the paper, advised on data analysis and interpretation, and revised the manuscript.

JN helped with interpretation of the results and revised the manuscript.

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JS helped with interpretation of the results and revised the manuscript.

AV helped with interpretation of the results and revised the manuscript.

5. The paper reported in Chapter 7:

Cocker F, Martin A, Sanderson K. Managerial understanding of presenteeism and its economic impact. *International Journal of Workplace Health Management*, 5 (2): 76-87.

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## **Abstract**

**Background:** Employed individuals reporting depression can take a sickness absence (absenteeism) or continue working when ill (“presenteeism”); either decision has potential benefits and harms. Whilst absenteeism has received considerable attention from researchers, presenteeism is a newer concept. Understanding of its causes and consequences, particularly amongst individuals reporting depression, is less established.

**Aims:** This thesis aimed to determine the socio-demographic, financial, work and health-related correlates of depression-related presenteeism, in the Australian workforce generally and in the under-researched small-to-medium enterprise (SME) sector. It systematically compared the costs and health outcomes of depression-related presenteeism and absenteeism. Finally, it explored managers’ understanding of sickness presenteeism, and validated the “Team Production Interview” method for valuing related productivity loss.

**Methods:** Population-based data was used to identify correlates of presenteeism amongst employed Australian adults reporting lifetime major depression (Chapter 3), and used in state-transition Markov models to estimate the costs and health outcomes of depression-related absenteeism versus presenteeism (Chapter 6). A systematic review aimed to determine the prevalence and correlates of depression, psychological distress, related absenteeism and presenteeism, and the associated health and economic outcomes, in SMEs (Chapter 4). Baseline data from a RCT designed to evaluate a mental health promotion program for SME owner/managers was used to identify the proportion reporting high/very high psychological distress, the prevalence and correlates of associated absenteeism and presenteeism, and estimate the subsequent productivity loss (Chapter 5). Cognitive interviewing data with managers was used to validate the “Team Production Interview” (Chapter 7).

**Results:** Work and health factors had little influence on presenteeism behaviour over and above socio-demographic and financial factors. Significant factors were marital status, housing tenure and co-morbid mental disorders (Chapter 3). The systematic review found a dearth SME-specific information regarding the prevalence and

correlates of depression, related absenteeism and presenteeism, and the associated health and economic outcomes (Chapter 4). Approximately 30% of SME owner/managers reported high/very high psychological distress, of which 90% reported past month presenteeism and reduced productivity. No SME-specific factors were associated with presenteeism (Chapter 5). Absenteeism was more costly than presenteeism and offered no improvement in health (Chapter 6). Finally, managers misunderstood concepts of presenteeism and chronic disease, and reported an inability to answer Team Production Interview items due to perceived inexperience managing workers with chronic disease, or difficulty applying questions to their workplace (Chapter 7).

Conclusions: Presenteeism reporters may be milder cases of depression, and benefit from arrangements that allow absence for treatment and recovery whilst maintaining work attendance and the potential benefits of social support. As better self-rated health was associated with presenteeism amongst SME owner/managers, flexible work arrangements may also benefit the SME sector. Employers benefit from continued employee productivity and reduced long-term sickness absence. The finding that absenteeism costs more than presenteeism and offers no additional health benefit provides support for such measures. Modifying the Team Production Interview will improve managers' understanding of chronic illness and presenteeism, and ensure precise valuation of presenteeism-related lost productive time to inform employers, and relevant decision makers, of the relative efficiency of the aforementioned strategies.



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## List of abbreviations

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HCA	Human Capital Approach
MDD	Major Depressive Disorder
ICD	International Classification of Diseases
DSM-IV	Diagnostic and Statistical Manual
APA	American Psychiatric Association
NSMHWB	2007 National Survey of Mental Health and Wellbeing
ABS	Australian Bureau of Statistics
CI	Confidence interval
RR	Risk ratio
SD	Standard deviation
SE	Standard error
SME	Small-to-medium enterprise
K10	Kessler 10 Psychological Distress Scale
OECD	Organisation for Economic Cooperation and Development
RCT	Randomised Controlled Trial
PSU	Population Sampling Unit
GP	General Practitioner
WHP	Workplace Health Promotion

## **Publications**

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### **Publications directly arising from the work described in this thesis**

#### Chapter 3:

Cocker F, Martin A, Scott J, Venn A, Otahal P, Sanderson K. Factors associated with presenteeism amongst employed Australian adults reporting lifetime major depression with 12-month symptoms. *Journal of Affective Disorders*, 2011; 135, 231-40.

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### **Manuscripts submitted for peer-reviewed journals**

#### Chapter 4:

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#### Chapter 5:

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#### Chapter 6:

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**Cocker F**, Martin A, Scott J, Venn A, Sanderson K. Absenteeism and Presenteeism amongst Employed Adults reporting Major Depression: Results from the 2007

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**Cocker F**, Martin A, Scott J, Otahal P, Venn A, Sanderson K. Do predictors of depression-related absenteeism amongst employed, Australians vary by symptom severity? 13th International Congress of IFPE (International Federation of Psychiatric Epidemiology), March/April, 2011 Kaohsiung, Taiwan. Oral presentation.

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| 2011 | Travel Bursary Award, 2011 13th International Congress of IFPE (International Federation of Psychiatric Epidemiology), Kaohsiung, Taiwan.  |
| 2011 | Travel Bursary Award, 2011 Mental Health Council of Australia Grant in Aid to attend the Australian Society of Psychiatric Research (ASPR) Annual Conference, Dunedin New Zealand. |
| 2012 | Finalist in Australian Society of Medical Research (ASMR) Medical Research Week student award.   |

## **Chapter 1. Introduction**

---

### **1.1 Background**

Depression is highly prevalent within the working population and potentially costly (1, 2). Workers experiencing depression can take a sickness absence (absenteeism) or continue working when sick, known as presenteeism. Employed individuals reporting depression are often able to continue working, and more likely to do so than individuals with other health conditions (3, 4). Therefore, a large proportion of the economic cost of depression can be attributed to presenteeism-related lost productive time. Recent US estimates suggest 80% of depression-related productivity loss is attributed to presenteeism alone (2).

Presenteeism research has become increasingly widespread over the last decade (5). Studies have focused on the prevalence of presenteeism in different occupational groups, its determinants or risk factors, the effect it has on health and productivity, and, most recently, accurate and reliable methods to capture its health and economic impact. However, as recently as 2008, the number of articles addressing sickness presenteeism was just 0.01% of those dealing with sickness absenteeism (6). Further, research identifying the positive association between depression and presenteeism frequency emerged as recently as 2001 (4). Therefore, there is little known about what prompts continued work attendance amongst individuals experiencing depression, the costs compared to health outcomes of depression-related presenteeism, and the most accurate methods of valuing presenteeism-related lost productive time.

In a review of studies exploring factors associated with absenteeism and presenteeism among depressed workers, Lagerveld et al (7) found most described relationships between disorder-related factors, such as symptom severity, and the presence of co-morbid physical or mental disorders. However, identifying which work and personal/non-work factors influence work attendance decisions is also necessary. Ascertaining which factors are amenable to intervention and change may improve illness management in the workplace via informed development of practice guidelines for employers designed to prevent or reduce presenteeism and the associated health and economic consequences. Further, exploring whether the

influence of work-related and personal/non-work factors differ by occupation type or work setting is important for informing the adaptation of the aforementioned guidelines to specific groups of workers with potentially more favourable outcomes.

To date, the majority of research into the consequences of working when ill has focused the economic impact. Therefore, much less is known about the potential for presenteeism to confer positive health and social outcomes for individuals (8-10) via social support, daily structure, and the sense of purpose work can provide (11). Such outcomes may outweigh any costs. Systematic comparison of the costs and the positive and negative health outcomes of absenteeism compared to presenteeism amongst employed individuals reporting depression are vital, as it will provide evidence for recommendations as to whether to continue working when ill, or take an absence from work.

Finally, the potentially large economic impact of lost productive time due to depression-related presenteeism highlights the need for precise monetary valuation; that is, an established method to derive monetary estimates of the cost of lost productivity. To date, several methods for valuing lost productive time due to sickness absenteeism and presenteeism have been developed, most of which require a judgment or decision on the managers or supervisors part. However, none of these existing methods have been validated. Further, recent reviews of methods used to measure health-related productivity loss have highlighted the fact that existing instruments are extremely varied in their approach, produce widely disparate estimates of productivity loss, and identified that direct measurement of job productivity is difficult, particularly in knowledge-based occupations (12, 13). Additionally, several studies have now posited that commonly used methods, such as the Human Capital Approach (HCA), which express productivity loss as the product of self-reported lost time by daily salaries, may only provide a lower-bound estimate of lost productive time (12, 14-16). Therefore, rigorous evaluation of methods designed to capture variations across job types in how output is valued is warranted.

This thesis will address the identified gaps in knowledge regarding the correlates and consequences of presenteeism amongst employed individuals experiencing depression and psychological distress, and the valuation of associated lost productive time.

## **1.2 Depression**

Depression can be experienced on a continuum from sub-threshold symptoms to major depressive disorder (MDD). An individual's experience can differ according to symptoms reported, natural history, and treatment response. Depression can be chronic and recurrent and, combined with an average age of onset around thirty, can affect an individual's behavioural, cognitive, emotional, interpersonal, and physical function throughout much of their lives (3, 17). Depression often occurs with, and is complicated by, chronic mental or physical disorders such as anxiety, cardiovascular disease, and diabetes (18, 19) and has been identified as a risk factor for certain chronic diseases, including cardiovascular disease, arthritis, asthma, hypertension and migraines (20).

### **1.2.1 Definition and classification of depression**

Depression describes a variety of sometimes concurrent experiences. For some, being depressed may mean feeling sad, dejected, disappointed or upset. However, experiencing these emotions does not warrant a diagnosis of 'clinical' depression as such feelings are common, occur briefly, are often reactions to events or circumstances, and have a minor impact on daily functioning. By contrast, clinical depression is an intense emotional, physical and cognitive state which lasts for at least 2 weeks and has a significant, negative effect on an individual's life and their ability to function. Therefore, "depression" covers a range of states from feeling sad, helpless, or demoralized, to a major depressive episode (21). The term depression is used to variously describe depressive symptoms only, and a disease with strict definition criteria. The two most widely used, criteria-based classification systems for mental disorders, including depression, are the International Classification of Diseases (ICD) developed by World Health Organization (WHO), and the Diagnostic and Statistical Manual of Mental disorders (DSM -IV) developed by the American Psychiatric Association (APA) (22).

To date, many of the depression measurement scales are assessed in terms of their coverage of the DSM criteria (21), which places depression within the mood

disorders category and relies on classification by symptoms. Specifically, marked weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue, feelings of worthlessness or guilt, diminished ability to concentrate, and suicidal threats are used as boundary markers for major depression. At least five or more must be present to warrant a diagnosis. Further, frequency and duration of symptoms are considered as they must have occurred nearly every day for the past two weeks. Severity is determined by the number of these symptoms an individual reports and the degree to which they hinder their participation in their daily activities.

The symptoms of depression are varied and can affect emotions, thinking or cognition, behaviour and physical wellbeing, and are generally grouped into affective, cognitive and somatic (21). Affective and cognitive symptoms are commonly reported and can include feelings of sadness, anxiety, guilt, anger, hopelessness, and helplessness. Excessive worry and negative thinking are also common as individuals' thoughts about themselves and their circumstances are characterised by self-criticism, self-blame and pessimism. Such thought patterns may also increase suicidal ideation and thoughts of death. Further to changes in thought patterns, cognition is often affected, leading to indecisiveness, confusion and impaired memory or concentration. Individuals experiencing depression may report changes in their behaviour such as an inability to complete daily tasks or enjoy previously pleasurable activities due to a loss of interest (anhedonia). They may also withdraw from others, neglect their responsibilities and personal appearance, and experience decreased motivation.

The affective and cognitive symptoms included in a DSM-IV diagnosis of depression may be exacerbated by additional somatic symptoms such as disruption to regular sleeping patterns, including sleeping too much (hypersomnia) or having trouble sleeping (insomnia), or changes in eating habits, such as a loss of appetite or eating too much, which can produce significant weight changes. Irritability and agitation is commonly expressed due to annoyance at a lack of energy or drive. Other disruptive physical symptoms may include irregular menstrual cycles for women, loss of sexual desire, and unexplained somatic symptoms such as aches and pains.



### **1.2.2 Etiology of depression**

Depression has a complex multifactorial etiology (23-25). Contributing factors can include genetic susceptibility, life stressors or adverse life events (26), illness or injury (27, 28), or unfavourable working conditions and work stress (29-31). More specifically, environmental or psychosocial factors, including stressful work-related or life events like organisational change or the death of a significant person (32), lack of social support, and experience of a severe or chronic physical disorder such as myocardial infarction (33) or cancer (34), have all been implicated in the development of depression (32). Neuroimaging studies suggest abnormalities in the orbital and medial prefrontal cortex of the brain, the amygdala, and related parts of the striatum and thalamus contribute to the pathogenesis of depressive symptoms (35). A family history of depression also increases the risk of developing depression when compared to individuals with no history of depression amongst their relatives (36). Personality features such as dependence on social support and approval from others, lower tolerance for frustration, and unstable self-esteem (37), constricted social skills and behaviours (38), or a negative perception of self may also dispose an individual to develop depression (39). Personality may also influence how a person reacts to a stressful life event and thus play a significant role in the development of depression. Finally, socio-economic and socio-demographics factors, such as gender (24) and low socio-economic status (i.e. low educational outcomes and income levels) (40-42), may influence the development of depression.

## **1.3 Epidemiology and burden of depression**

During the 20th century and into the 21st, depression has received increased public attention and drawn the focus of policy makers at the national and international level. Depression is now recognised as a significant public health concern.

A recent review of the World Health Organisation's World Mental Health (WMH) surveys on the global burden of disease, reported major depressive disorder has a lifetime prevalence of 4-10% and 12-month prevalence estimates in the 3-6% range (43). This makes it second only to social phobia as the most prevalent mental disorder in community epidemiological surveys (43). The World Health

Organization (WHO) also estimates that depression accounts for 4.5% of the worldwide total burden of disease and was responsible for the greatest proportion of burden attributable to non-fatal health outcomes, accounting for almost 12% of total years lived with disability globally (44). Further demonstrating this impact, the WHO predicts depression will become the second most important cause of disability in the world, after cardiovascular disease by the year 2020 (45).

Contributing further to the burden of depression are the elevated risk of suicide and suicide attempts and the high prevalence of comorbid physical health conditions. Existing evidence confirms a strong association between major depressive disorder and completed suicide (46-49), with a lifetime mortality risk by suicide for individuals with major depressive disorder around 15% (50). Major depression is also common in people with medical illnesses. Recent WHO estimates revealed the 12-month prevalence for an ICD-10 depressive episode rose from 3.2% to 4.5% for individuals experiencing angina, and 4.1% and 3.3% for individuals experiencing arthritis and asthma respectively, and between 9.3% and 23% of individuals with one or more chronic physical disease had comorbid depression (44). Further, using WHO World Health Survey data, Moussavi et al (44) reported that the comorbid state of depression incrementally worsens health compared with depression alone (51). Finally consistent epidemiologic evidence suggests that co-occurrence of depression with other mental conditions is highly prevalent (55). For example, a recent Finnish cohort study revealed 79% of patients with Major Depressive Disorder (MDD) suffered from 1 or more current co-morbid mental disorder, including anxiety disorder (57%), alcohol use disorder (25%), and personality disorder (44%). Similar findings were reported in the 2007 National Survey of Mental Health and Wellbeing which revealed that 25.4% of persons with an anxiety, affective or substance use disorder had at least one other class of mental disorder (13).

The impact of depression is felt particularly keenly within the Australian population because of its high lifetime prevalence, its effect on an individual's physical, mental and social functions (3), and its association with an increased risk of premature death (52). Data from the 2007 National Survey of Mental Health and Wellbeing (NSMHWB) (53) revealed 3.2 million (20%) Australians had a 12-month mental disorder, that is, the presence of disorder symptoms in the 12 months prior to the survey interview. More specifically, 6.2% had a 12-month affective disorder,

including Depressive Episode and Dysthymia. Depression, in combination with anxiety, accounts for over half of the 7.3% of the total burden of disease and injury represented by mental disorders in Australia (54).

### 1.3.1 Course and prognosis

Depression can be considered a chronic-episodic mental disorder. Cross-sectional surveys have consistently reported that the prevalence ratio of 12-month major depression versus lifetime major depression is between 0.5 and 0.6 (55). This indicates between 50% and 60% of people who have ever been clinically depressed will be in a major depressive episode in any given year. Further, more than 80% of people with a history of major depression have recurrent episodes (56). Specifically, the National Comorbidity Survey (NCS) conducted in the United States, found 72% of depressive patients reported more than one episode (56), and estimates from the Netherlands Mental Health Survey and Incidence Study (NEMESIS) (30) and the German National Health Interview and Examination Survey (GHS-MHS) are around 50% (31).

The course of major depression varies depending on a number of determinants including age at onset, sex, family history, co-morbidities and severity of symptoms (57). Age at onset is an extremely important determinant as a major depressive episode can begin at any point in an individual's life (58). It is common for prodromal symptoms, such as anxiety symptoms (panic attacks, phobias) or depressive symptoms that do not meet diagnostic criteria to occur in the preceding period. However, major depression can also develop suddenly, such as when it is a reaction to a stressful, major life event (28).

The severity of presenting symptoms of major depression varies from mild to severe with the most severe cases potentially leading to suicide and warranting life-saving interventions (57). Further evidence suggests that age at onset and severity of depressive symptoms are correlated with "chronicity" of depressive disorder. That is, individuals who experience more severe symptoms and at an earlier age tend to have a more chronic disease course than individuals who experienced later onset and less severe episodes (57).

Important terms to consider in the longitudinal course of major depressive illness are “response”, “recovery”, “relapse”, “remission” and “recurrence”. Frank et al conceptualized these terms as (59):

- “Response” is a reduction in depressive symptoms without returning to normal baseline as opposed to remission.
- “Remission” is the stage of decrease in symptoms to baseline levels
- “Recovery” is a sustained period of remission for an arbitrarily chosen time criterion (4-6 months)
- “Relapse” is the return to major depression within the period of remission.
- “Recurrence” is a new episode of major depression following a period of remission.

Further, important aspects in the longitudinal course of major depression to be considered in terms of prognosis are relapse and/or recurrence, duration of episode and time to recurrence. Many depressive patients recover fully between episodes, but 20 to 30% of cases only partial remit and experience persistent residual symptoms and impairment. Further, a significant number of depressive patients suffer from a “progressive” course of disease, defined by “cycle acceleration”, where the length of time to their next episode decreases with each recurrent episode.

Also worthy of consideration is that the course and prognosis of major depression can be further complicated by co-morbidity. Community samples show that there is substantial lifetime and episode comorbidity between depression and other mental disorders and substance use disorders (56). Results from the National Co-morbidity Survey Replication (NCS-R) revealed that almost three quarters of respondents with lifetime major depressive disorder also met criteria for at least one lifetime comorbid substance use disorder (56). Further, approximately two thirds (65.2%) of respondents with 12-month major depressive disorder met criteria for at least one other 12-month disorder.

## **1.4 Depression in the workplace**

Depression is highly prevalent in the general population and thus common within the working population (61). Depression has been shown to have the largest individual-

level effect on work performance when compared to other conditions (62), and can impair a worker's cognitive, behavioural, emotional and physical ability (63). Moreover, the peak onset of depression or depressive illnesses often occurs between 30 and 40 years of age meaning it is likely to affect workers early in and throughout their entire working life (64). Therefore, the high prevalence and early onset of depression, its often chronic and recurrent course, and the associated functional impairment combine to make it a leading cause of disability worldwide.

Depression symptoms experienced in the workplace may lead to unfinished projects, loss of interest in work or a substandard work performance. Individuals can experience poor concentration, lack of motivation, restlessness, and fatigue and reduced decision-making capacity, which may prevent them from carrying out their employment duties. Irritability combined with these symptoms can further affect the employee's working relationships with employers and co-workers. Furthermore, reduced work productivity due to depression is evident across all types of work activity including mental-interpersonal tasks such as speaking with people in person, in meetings or on the phone and time management tasks such as the ability to "get going" at the beginning of a work day and to stick to a routine or schedule (3).

Individuals experiencing depression are often able to continue working and are more likely to do so than persons experiencing other health complaints (3, 4, 65). This means that much of the health and economic burden of depression is likely to be borne by the workforce. It is well established that the economic costs of depression are high. The substantial economic impact of depression is in part due to direct treatment costs such as inpatient, outpatient and pharmaceutical care as well as indirect costs including early retirement costs, increased workplace accidents, and premature death (17, 66, 67). However, research indicates the economic burden of depression is mostly attributed to losses arising from sickness absence and, more significantly, reduced productivity of sick individuals who continue to work, or presenteeism (68). This thesis will review depression-related presenteeism from a behavioural perspective in which presenteeism is a health behaviour i.e. continuing to work when ill. However, first, a more general review of the presenteeism field is warranted.

## 1.5 Depression-related work attendance behaviour: Presenteeism

Unlike absenteeism, an easily understandable concept of failing to attend work when ill, the idea of presenteeism is relatively new and has been subject to numerous definitions. For example, Table 1-1 summarizes nine main definitions of presenteeism taken from existing literature and demonstrates that although all of the definitions concern being present at work, there are important difference between them. In his recent review Johns (69) highlights that presenteeism has been portrayed as positive behaviour (definitions a and b), obsessive (definitions c, d, and e), at odds with one's health status (definitions e, f, and g), and less than fully productive (definitions h and i).

**Table 1-1.** Definitions of presenteeism

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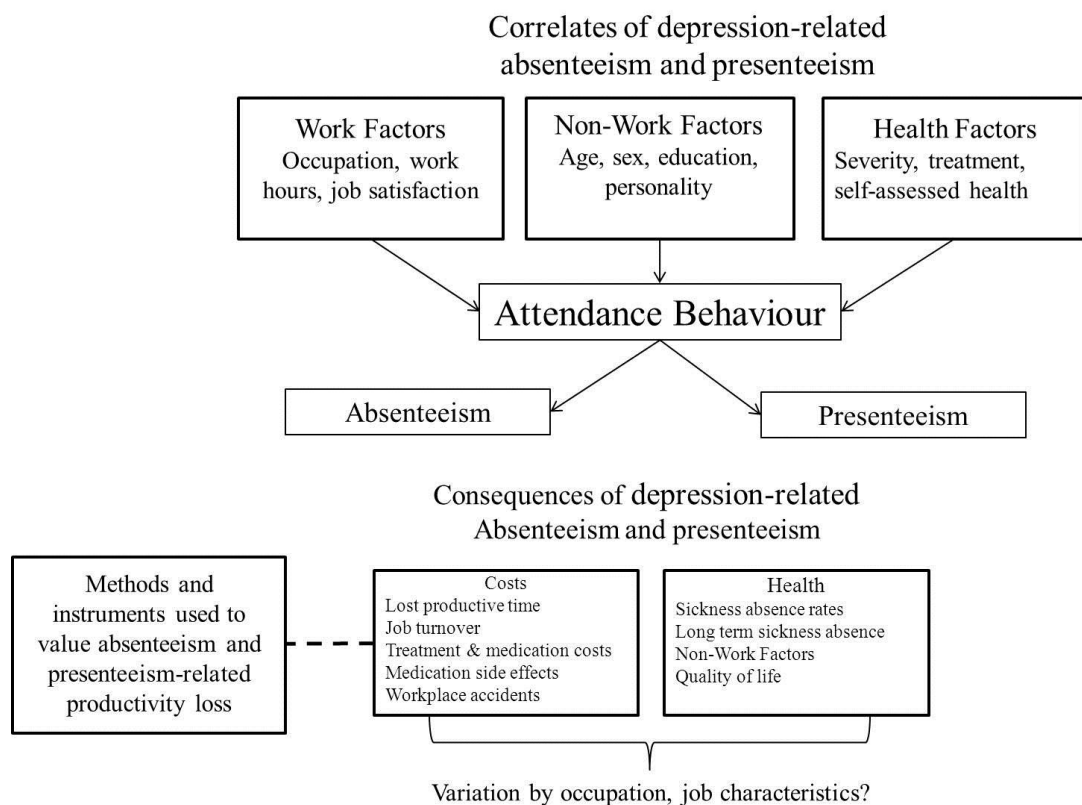
a.	Attending work, as opposed to being absent (70)
b.	Exhibiting excellent attendance (71, 72)
c.	Working elevated hours, thus putting in "face time" even when unfit (73,74)
d.	Being reluctant to work part-time rather than full-time (75)
e.	Being unhealthy but exhibiting no sickness absenteeism (76)
f.	Going to work despite feeling unhealthy (8)
g.	Going to work despite feeling unhealthy and experiencing other events that might normally compel absence (e.g. child care problems) (77)
h.	Reduced productivity at work due to health problems (78)
i.	Reduced productivity at work due to health problems or other events that distract one from full productivity (e.g. office politics) (79,80)

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Evidenced by the number of published studies that employ it, the most widely accepted definition of presenteeism is the one developed by Aronsson, Gustafsson, and Dallner (8) (definition f): attending work despite complaints of ill health that would normally prompt rest or absence. Put more simply, presenteeism is the act of attending work when ill (10) and this definition does not attribute motives or consequences to presenteeism. This definition is employed throughout this thesis.

Initial presenteeism research posited that continued work attendance when ill occurred in a minority of workers. However, more recent studies expose it as a widespread phenomenon (6, 81) which manifests indiscriminately across occupational groups (82) and results in substantial productivity losses (83). To date, current presenteeism research can be categorized into two schools of thought; i) organisational scholars who have been concerned with precursors, correlates and predictors of the behaviour of presenteeism e.g. (6, 8, 9), and ii) health scholars

34whose focus has been the consequences, both health and economic, of continued work attendance e.g. (84, 85). Potentially diverse motives may underpin not only the act of presenteeism but also the unequal degrees of productivity loss exhibited by employed individuals experiencing the same condition. Therefore the main questions that have driven presenteeism research thus far have been; a) what influences an individual's decision to continue working when ill; b) do these same factors determine or influence the related health and economic consequences and; c) what are the health outcomes and costs of continued work attendance behaviour. A third more emerging field of presenteeism research relates to developing new instruments to accurately value the costs associated with presenteeism-related lost productive time in response to identified inadequacies with current methods of estimation. Figure 1-1, adapted from a model developed by Aronsson et al (5) represents these distinct research foci.



**Figure 1-1.** A model for research into sickness presenteeism.

### 1.5.1 Correlates of presenteeism

Identifying which factors influence work attendance decisions and which are potentially amenable to intervention or change may inform the development of

workplace mental health promotion programs and interventions designed to not only reduce presenteeism behaviour but also prevent, or at least ameliorate, the associated health and economic consequences or outcomes. Further, by identifying whether the most influential factors are work or non-work related, setting-specific preventive strategies can be designed and implemented in the workplace.

To date, research in this area has been guided by the assumption that factors related to sickness absenteeism also affect sickness presenteeism (86, 87). Specifically, Caverley et al (84) formulated the *substitution hypothesis* which posited that presenteeism occurs in situations where absenteeism is not possible. That is, any work or non-work factors that constrain absenteeism may prompt presenteeism (69). As a result, research into the correlates and precursors of presenteeism behaviour have been largely guided by existing research into the predictors of sickness absence. However, because sickness presenteeism is a relatively new concept compared to absenteeism, emerging as a subject of empirical research as late as the 1990s, this information is relatively sparse. Further, no studies have attempted to determine what influences work attendance decisions amongst individuals reporting depression, despite the recognised impact it has on employee productivity.

Three distinct models have emerged which incorporate existing research. They are commonly used to guide research into the correlates of sickness presenteeism. Aronsson and Gustafsson's (5) model was one of the first to identify the act of presenteeism as part of a decision process in which an individual chooses to continue working or take a sickness absence. Hansen and Andersen (2008) expanded this model by considering the influence of organisational and individual factors on work attendance decisions. Briefly, these models identify specific health problems as primary presenteeism determinants, but posit that individual and organisational factors are the decision levers that determine the choice to come to work in spite of their illness. That said, it must be acknowledged that some employers, such as small business owner/managers who have multiple role responsibilities, may not have a choice or may not consider sickness absenteeism a viable option. This approach is championed by Johns (88) who suggests all of the associated productivity loss is due to semi-objective health indicators (83, 89) and that presenteeism research must move beyond the assumption the behaviour is a function of a medical condition and that consider the influence of psychosocial variables.



Existing literature, informed by the aforementioned models, has identified several factors that may influence work attendance decisions. These have included organisational policies concerning pay (8, 90), sick pay (89, 92), downsizing (93), and permanency of employment (8, 94-96). Various job design factors such as workload and job demands (97-99), workers replacement practices (6, 8, 9, 84), teamwork (90), and occupation type may also prompt or discourage presenteeism. Finally, attendance pressure from employers and colleagues (9, 101), corporate culture and norms within an occupational group (102) may also influence work attendance decisions, as might personal attitudes (6), values, and personality characteristics.

In terms of organisational policies, several studies have reported that less generous sick leave plans lead to less sickness absence (80) and thus increased presenteeism (91). Specifically, Lovell (103) revealed that workers without paid sick leave are more likely to continue working when ill as failure to attend or taking an unauthorised sickness absence can lead to loss of pay, job loss or diminish their job advancement prospects. Lovell also noted that working mothers are more likely to continue to work when ill as they “save” their sick leave for when they need to care for their sick children. Fear of job loss has also been used to describe the positive association between downsizing, intentional reduction in workforce size for supposedly strategic reasons (69), and presenteeism. Additionally, changes to job design and increases in workload that occur as a result of the downsizing process make absenteeism less favourable (69). Further, in their longitudinal, prospective cohort study of Finnish employees, Vahtera et al (94) identified that temporary employees were the most likely to engage in presenteeism following downsizing as they are most vulnerable to job cuts. This finding is supported by several studies which found that temporary, fixed-term, non-permanent employees exhibit more presenteeism, most likely due to a sense of job insecurity (8, 95, 96, 104).

Pressures to attend work despite illness may arise due to the structure of the work environment, work contract or the expectations placed on workers by employers and colleagues. Johns (69) suggested that job demands that necessitate attendance, such as care giving, may increase presenteeism and Demerouti (99) posited that employees in high-demand jobs may choose to attend work when ill in order to

maintain high levels of performance. Worthy of note is recent research suggesting that work attendance pressures may also increase feelings of job dissatisfaction, low psychological well-being and other symptoms related to stress (105) thus exacerbating the experience of depression. The complex interplay between low short-term sickness absence, high presenteeism and long-term sickness absence may also be influenced by employees' working conditions. That is, a failure to take a genuine short-term sickness absence, often influenced by pressure from employers, co-workers or the workers themselves, and continued work attendance whilst ill has been shown to lead to long-term sickness absence in the future (10, 35).

Other important job design features that may influence work attendance decisions are ease of replacement, team work, occupation type (8), and "sickness flexibility" (106), or the degree of control an individual has in the work situation (8). Sickness flexibility has two dimensions, adjustment latitude and attendance requirements. Adjustment latitude refers to the ease with which an employee is able to adjust or reduce their work demands to adapt task performance to his or her physical or mental condition. Attendance requirements refer to the negative consequences of absence such as the impact it may have on the individual, work-mates or a third party e.g. clients, care recipients, or students. A low degree of adjustment latitude, or less control over the pace of work, may increase an individual's risk of sickness absence at the cost of sickness presence. However, it must be noted that whilst Johansson and Lundberg confirmed that high attendance requirements increased the probability of attending when ill, adjustment latitude had little influence on presenteeism. In fact, they reported a slight trend for those who had to work full-time to continue working when ill more often than those who reported being able to reduce their work effort. Therefore, whilst worthy of mention, these findings suggest the direction and degree to which adjustment latitude influences work attendance behaviour is not yet firmly established.

Research into the impact of ease of replacement on presenteeism, defined as the degree to which work missed due to sickness absence has to be made up upon return to work, is more established and suggests individuals who know their work will accumulate during their absence are more inclined to continue working (8, 9). This may be due to their workplace being under-staffed or their job being highly specialised. Teamwork, or the sense that taking a sickness absence would be unfair to

colleagues, may also influence work attendance decisions. This may be particularly important in smaller business and organisations where a sense of family often develops. Finally, welfare and teaching occupations (8), jobs that require frequent customer contact (96) or jobs with supervisory responsibilities are associated with higher rates of presenteeism, due to perceived duty to clients, colleagues, or students. Such findings have also been reported amongst nurses (108-111), allied health professionals, hospital workers, and physicians (70, 112), and police officers (113, 114).

Recent studies have also suggested the importance of non-work factors such as demographics, personality characteristics, attitudes, values, and personal circumstances in an employed individual's decision to continue working when ill. Among the most important demographic predictors of presenteeism are gender (5), age (9, 104), and family status (6). Specifically, presenteeism is more common amongst older workers, women, and individuals for whom their home life may be more taxing than their work life. Regarding personality, conscientiousness has been found to be consistently, negatively associated with absenteeism (116-119), suggesting that more conscientious individuals will continue to work when ill. This is perhaps due to the fact that conscientious people tend to be reliable, responsible, and thorough (120) - traits that might motivate them to attend work even in the face of ill-health. Further, Aronsson and Gustafsson (5) coined the term 'individual boundarylessness' to describe a personality characteristic that makes it difficult for people to say no to other people's wishes, similar to what Siegrist (121) calls 'over-commitment'. Behind both concepts is the idea that a strong commitment to work will increase the likelihood of presenteeism. In terms of attitudes, Hansen and Andersen (6) reported that employees with "conservative" ideas about sickness absence and absence from work were most likely to engage in presenteeism.

Although a variety of factors have been identified as potential correlates of presenteeism behaviour, what influences continued work attendance amongst individuals reporting depression is less established. A recent systematic review (7) identified 30 studies exploring factors associated with absenteeism and presenteeism among depressed workers. However, presenteeism was defined as work functioning, including loss of productivity and work limitations, and not as behaviour. Further, the majority of studies reported on relationships with disorder-related factors, and

personal or work-related factors were addressed less frequently. This highlights the need to identify potentially modifiable factors associated with presenteeism behaviour within this population.

A more extensive search for studies exploring the potential correlates or predictors of depression-related work disability and/or presenteeism behaviour failed to identify any which investigated the relative importance of socio-demographic, financial, work and health-related factors. Further, no studies were found which investigated the degree to which depression-specific factors influence an employee's behaviour, nor any which investigated whether factors associated with presenteeism amongst employed individuals reporting depression differ by occupation type. Understanding the relative association of work and non-work characteristics with work attendance behaviours may identify which factors are amenable to change and/or intervention, potentially improving illness management through the development of informed practice guidelines. Additionally, identifying occupation specific factors may allow such recommendations to be tailored to particular job types or work settings such as small-to-medium enterprises (SMEs), where both poor mental health and presenteeism may be more common and more costly in terms of health and economic outcomes. Workplace practices which support employees experiencing depression and provide access to evidenced-based care could improve workers' quality of life and reduce costs to employers associated with absenteeism, presenteeism and lost productivity (122).

In relation to the research opportunities identified above, several studies were conducted and are reported in this thesis. **Chapter 3** describes a study using national representative population-level data to determine which work and non-work factors are associated with depression-related presenteeism; the relative importance of socio-demographic, financial, work and health-related factors in this association; and the degree to which depression-specific health factors influence work attendance decisions. Additionally, **Chapter 4** conducted a systematic review of stress, burnout and depression literature to determine whether SMEs experience poor mental health and related presenteeism more than other work settings. SMEs were considered worthy of particular investigation as unique organisational features may increase owner/managers susceptibility to depression, the frequency of presenteeism and exacerbate the associated, negative health and economic outcomes. This systematic

review, and the identified dearth of SME-specific literature addressing mental health-related work attendance behaviour and the related consequences, precedes the study reported in **Chapter 5** of this thesis. **Chapter 5** used baseline data from a randomised controlled trial designed to evaluate a workplace mental health promotion program aimed at improving the mental health of small-to-medium enterprise owner/managers to determine whether the correlates of presenteeism differ by work setting. Identifying SME-specific correlates of continued work attendance may allow the development of management guidelines and intervention strategies designed to reduce presenteeism and the negative consequences, tailored to the needs of the SME sector. This in turn is likely to benefit not only the business owner/managers and their employees, but the broader economy due to the significant contribution SMEs make to most developed economies worldwide.

### 1.5.2 Health and economic consequences of presenteeism – is it all negative?

The second significant area of presenteeism research relates to the associated health and economic consequences of the behaviour with the majority of research focusing on the costs associated with continued work attendance, particularly the cost of related lost productive time. Locally, health-related presenteeism costs the Australian economy an estimated \$25.7 billion (AUD) annually (123). This is approximately four times the cost of absenteeism and equates to an average of six working days of productivity per employee lost per annum (123). However, it must be noted that although this estimate is reflective of health-related presenteeism costs, it is from a report commissioned by Medibank Private, one of Australia's leading private health insurance funds, and completed by the economic modeling service provider Econtech. Therefore it is not a reliable, independent, academic reference. To our knowledge no such reference is available. Further, US estimates have shown presenteeism accounts for as much as 60% of the total direct and indirect costs of poor employee health, with medical, pharmacy, absenteeism, and disability costs accounting for the remainder (124).

The enormity of the estimated cost of depression-related presenteeism has ensured that attending work when ill is typically characterized as a negative phenomenon and a threat to employment stability (2, 125-128). However, there has been a failure, thus

far, to explore both the negative and potentially positive health, economic and social outcomes of presenteeism (8). Benefits of presenteeism may arise from social support and associated decreases of future depression risk (129), daily structure and routine and the sense of purpose that work can provide in addition to an income (11). Such outcomes may outweigh costs or negative consequences such as reduced productivity, employment instability or minor workplace accidents. Therefore, focusing consequences research on productivity loss, as opposed to productivity or health gain compared to absenteeism, may be unduly restrictive (69).

Previous studies have suggested whether workers decide to remain present at work or take a sickness absence determines who bears the brunt of the associated cost and subsequent health outcomes (130), but these models have not been empirically tested. The majority of productivity research has also been US based, where employers are often responsible for the health care costs of their employees. Furthermore, the influence of third parties, such as pharmaceutical companies, often reduces the focus on the individual health benefits and economic gains, despite costs to the employer as interested investors become more concerned with quantification and valuation of the productivity gains from treatment (131).

The lack of exploration of the potentially positive outcomes of presenteeism combined with the identification of its prevalence and the estimated enormity of its negative social and economic consequences highlights the need for accurate measurement and understanding. A focus on presenteeism and related outcomes may in fact help researchers, employers and employees, better understand sickness absenteeism as they are potentially products of the same decision process (132). Investigation of these novel questions may help to provide employers with useful information regarding the effects of presenteeism in their particular organisation which may in turn help them to specifically tailor workplace mental health promotion strategies employed to combat the negative consequences of absenteeism and presenteeism to their particular circumstance thus increasing their effectiveness. Therefore, **Chapter 6** of this thesis examined the potential costs and health outcomes of absenteeism versus presenteeism amongst employed Australians reporting major depression, as well as whether these costs and health outcomes vary by occupation type (blue- versus white-collar) in a nationally representative sample.

### 1.5.3 Valuation of presenteeism-related lost productive time

Understanding the positive and negative financial consequences of presenteeism requires accurate methods for its measurement and valuation in dollar terms. Several studies have suggested that if steps are taken to reduce the negative consequences of presenteeism, performance and profitability can be improved (123, 133, 134). However, the level of improvement depends on the cost presenteeism represents for an individual company. Therefore, it is important that businesses identify these costs and subsequent cost-effective action that can be taken to recover some, if not all, of the on-the-job productivity lost to employee health conditions (123). Even more importantly, the recognition of the potential to recoup health-related productivity losses has led to the identification of the need to develop accurate and robust presenteeism measures. That is, lost productive time contributes significantly to estimated costs or savings in appraisal of health-care programs, cost of illness studies or cost-benefit analysis (135, 136). Recognition of the importance of accurate valuation of productivity loss attributable to presenteeism behaviour and, by extension, the potential cost savings of intervention and workplace health promotion programs designed to reduce continued work attendance, has led to the a third emerging area of presenteeism research; developing and validating new methods and instruments to value presenteeism-related lost productive time.

### 1.5.4 Existing presenteeism measurement

Whilst Mattke et al (12) identified 20 instruments designed to measure absenteeism and presenteeism, many of which were validated, there were noticeably fewer methods designed to estimate the cost of associated productivity loss and whilst some were established, none were validated. Further, Mattke et al (12) identified significant challenges involved in valuing presenteeism-related lost productive time which far exceed those in measuring absenteeism, especially in non-manual knowledge-based jobs without easily measurable output.

To date, most research addressing the health and economic consequences of absenteeism and presenteeism has been solely from the employee's perspective. Investigations of associated outcomes have commonly focussed on the self-report of

perceived impairment in work performance or the amount of unproductive time associated with their illness (12). Following estimates of health related presenteeism and associated productivity loss monetisation methods are employed to calculate the associated costs. The vast majority of cost estimates are based on salary conversion, or the human capital approach, where loss of a healthy day represents loss of production whose value in competitive labour markets equals the money wage (12).

Whilst not without significant merit, the human capital method does not measure the actual, but only the potential productivity loss cost and risks underestimating the true cost of absenteeism and presenteeism. A recent US research suggests the cost of an absence day may be substantially higher than the daily wage for particular occupations (14). The daily wage rate may in fact represent the lower bound estimate for the cost of a day of missed work (14-16). Additionally, depending on the perspective from which the cost of lost productive time is viewed, such an approach may overestimate the loss. For instance, absenteeism- or presenteeism-related productivity loss may be overestimated if the work is accomplished despite the decreased productivity of one worker. Therefore, from the company's perspective, no loss has been incurred despite their employees having the work harder to compensate for a sick or absent colleague. For these reasons, new methods of costing health-related productivity loss attributable to work absence and attending work while ill are needed.

Accurate evidence on the cost of chronic illness in terms of lost productivity associated with absenteeism and presenteeism is essential for understanding the economic impact on the individual, employer, and society. Economic data is also used to guide investment in health-related programs by government departments and individual businesses. Established methods, as well as potentially misestimating the costs of absenteeism and presenteeism, could undervalue the employer and societal gains received from the implementation of policies aimed at the reduction of these costly health behaviours (14).

Differences occur in the cost estimates of absenteeism and presenteeism for different employees within different job types. These may arise from differences in the occupation's nature. For example, some jobs are crucial to the overall productivity of a work unit and some are difficult to replace at short notice owing to labour shortage



of the specific skills required, such as an engineer or a podiatrist. Time constraints influencing an employee's work are also influential (14-16).

### 1.5.5 Developing job-specific wage multipliers using managers estimates of productivity loss

Using a new method developed by a US-based research team, the estimated costs of an absenteeism day may actually cost substantially more than the wage rate (14). This new approach, called the Team Production Interview, takes into account variability between jobs in how output is produced. It considers the differences across occupations regarding the time sensitivity of output, degree of team work or interdependent productivity, and ease with which an employee can be replaced by an equally qualified substitute. In the case of an engineer, whose work is team-based and difficult to replace at short notice in the US, the Team Production Interview estimated that the factor by which the wage rate is inflated was equal to 2.04.

The information used to develop these multipliers was collected from the manager's perspective. This approach has a distinct advantage as research suggests managers are more aware of the productivity impacts and potential consequences of absenteeism and presenteeism than employees. For example, employees may not be fully aware of what has occurred whilst they were absent or how attending work whilst ill has affected their co-workers. These methods also ensure cost estimates are relevant to managers and their decisions which may encourage more proactive involvement and implementation of programs designed to prevent depression in the workplace and related productivity loss (137). The majority of programs to date have failed to be universally persuasive to top levels of management (15). The benefits of employers' increased willingness to implement workplace health promotion interventions include the potential for improved employee health and increased output, which is of potential value to the workers, their managers and the economy.

This approach to costing lost productivity is very new and has not been replicated beyond the research group that devised it. It is vital to replicate their findings in different contexts due to the differences in the labour market between the USA and other countries. Further, the formation of job-specific multipliers to calculate absenteeism- and presenteeism-related productivity loss creates a quick and easy way

for employers to gauge the effect that illness has in their workplace and provides important new data to estimate potential cost savings, or the relative cost-effectiveness of workplace health programs aimed at improving medical care to enhance employee's functional status. This type of information is also increasingly used by policy makers (137). Therefore, **Chapter 7** is dedicated to reporting on a study, which used the aforementioned methods (14-16), to provide important information on the applicability of this methodology, with the possibility of using subsequent findings in a larger study to develop a daily wage multiplier table for a broad range of occupations.

## **1.6 Summary**

Depression is prevalent within the working population. Employed individuals experiencing depression can take a sickness absence or continue working when ill, a behaviour known as presenteeism. Whichever decision they make is likely to have potentially costly health and economic consequences for themselves, their co-workers, their employers, the businesses or organisations for which they work, and society in general via the associated lost productive time. However, workers with depression are more likely to continue working than employed individuals with other health conditions, a large proportion of the health and economic outcomes of depression occur as a result of continued work attendance.

Despite the recognised impact of presenteeism, it is a relatively new concept and thus the information available as to what prompts continued work attendance amongst workers reporting depression is scarce. This makes the management of work attendance difficult as employers cannot pinpoint which influential factors can be modified in order to prevent or ameliorate presenteeism within the workplace. Further, the majority of research investigating the consequences of continued work attendance has focused on the cost outcomes rather the potential health benefits or detriments. Therefore, there is little evidence to support the recommendation that employed individuals reporting depression should continue working as opposed to taking a sickness absence. Finally, current methods used to value presenteeism related lost productive time may be underestimates of the total cost as they fail to take into account variation across jobs in how output is produced. Therefore new

methods need to be developed and validated to provide accurate estimates of productivity loss due to continued work attendance.

Addressing these identified research gaps will: a) provide evidence to help clinicians and employers, in various occupational settings, manage work attendance behaviour to ameliorate presenteeism and its health and economic consequences; b) provide evidence to support recommendations that employed individuals experiencing depression should continue working; and c) evaluate the Team Production Interview and, if necessary, inform recommendations for instrument development to improve manager's comprehension of key concepts, and valuation of chronic illness and related presenteeism. These studies will substantially contribute to the understanding of the causes and consequences of depression-related presenteeism and how to accurately value related lost productive time and provide evidence for the development of workplace mental health promotion strategies and scope for future research in an emerging field.

## **1.7 Thesis aims and research questions**

### **1.7.1 General aim**

This thesis aimed to identify the correlates of presenteeism amongst employed individuals reporting depression and psychological distress, estimate the health and economic consequences of this behaviour, and explore a new method for valuing the associated lost productive time.

### **1.7.2 Specific objectives**

The specific aims of the investigations reported in this thesis were:

- i. To determine the correlates of depression-related presenteeism in the Australian working population [Chapter 3], and within a sample of small-to-medium (SME) enterprise owner/managers reporting high/very high psychological distress [Chapters 4, 5];

- ii. To estimate the economic costs and health outcomes of depression-related absenteeism as compared to presenteeism within the Australian working population [Chapter 6];
- iii. To validate a newly developed method for valuing lost productive time due to acute- and chronic illness related absenteeism and presenteeism, and assess managers' understanding of these concepts and their impact using cognitive interviewing techniques [Chapter 7].

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## **Chapter 2. Methods**

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### **2.1 Preface**

This thesis aims to investigate the correlates and consequences of presenteeism amongst employed individuals experiencing depression and psychological distress in several working populations, and evaluate existing methods used to value the associated lost productive time. This chapter provides details on the samples used, the studies from which those samples were derived, the study factors investigated in the chapters that follow, how these study factors were measured, and the methodologies used to investigate them.

### **2.2 The 2007 National Survey of Mental Health and Wellbeing**

This data source was used in Chapters 3 and 6. The 2007 National Survey of Mental Health and Wellbeing (NSMHWB) was conducted by the Australian Bureau of Statistics (ABS) between August and December 2007. The survey collected information from 8,861 Australians aged 16-85 years on the prevalence of selected lifetime and 12-month mental disorders, by the major disorder groups: Anxiety disorders (e.g. Social Phobia), Affective disorders (e.g. Depression); and Substance Use disorders (e.g. Alcohol Harmful Use). The survey also collected information on the level of impairment related to those disorders, health services used for mental health problems, physical conditions, social networks and caregiving, as well as demographic and socio-economic characteristics.

#### **2.2.1 Survey Development**

The NSMHWB was based on a widely-used international survey instrument developed by the World Health Organization (WHO) for use by participants in the World Mental Health Survey Initiative (1, 2). The World Mental Health Survey Initiative is a global study aimed at monitoring mental and addictive disorders, and has been run in 32 countries, including Canada, South Africa, and New Zealand, to gather information about the prevalence of mental, substance use, and behavioural disorders, measure the severity of these disorders and determine the associated



burden for families, carers and the broader community. The initiative also collected information about the receipt of sufficient treatment for these disorders and identified the barriers to adequate treatment. The majority of the NSMHWB was based on the international survey modules developed by the WHO. However, some modules, including the Health Service Utilisation, were adapted in collaboration with experts from academic institutions, government departments and consumer groups to better fit the Australian population and health system.

Extensive pre-testing, involving cognitive interviewing and expert evaluation, was conducted during the development phase of the NSMHWB. Pre-testing evaluated respondents' understanding of proposed concepts and questions, their reactions to potentially sensitive data items, and their reactions potential to prevent accurate reporting. Following the identification of any troublesome survey items, appropriate changes or alterations were made, thus improving the construct validity of proposed questions. Cognitive laboratory interviews involved conducting semi-structured interviews provide insight into the thought processes used to answer survey questions helped determine better ways of constructing and asking survey questions. Secondly, expert evaluation involved a peer review process to identify respondent semantic and task problems, assessed content validity and translated concepts. The survey was also field tested prior to its launch.

### **2.2.1 Sample Design**

Dwellings included in the survey in each state and territory were selected at random using a stratified, multistage area sample. To improve the reliability of estimates for younger (16-24 years) and older (65-85 years) persons, these age groups were given a higher chance of selection in the household person selection process. That is, if you were a household member within the younger or older age group you were more likely to be selected for interview than other household members.

For the NSMHWB, separate person and household weights were developed. Weighting is the process of adjusting results from a sample survey to infer results for the total in-scope population by allocating a 'weight' to each sample unit corresponding to the level at which population statistics are produced, e.g. household

or person level. This weight is considered an indication of how many population units are represented by the sample unit.

Assigning an initial weight, equal to the inverse of the probability of being selected in the survey, is the first step in calculating weights for each person or household. As only one in-scope person was selected per household, the initial person weight was derived from the initial household weight according to the total number of in-scope persons in the household and the differential probability of selection by age was used to obtain more young (16-24 years) and older (65-85 years) people in the sample. Person and household weights were then separately calibrated to independent estimates of the population of interest, referred to as 'benchmarks'.

Benchmarking ensures the survey estimates conform to the independently estimated distributions of the population rather than to the distribution within the sample itself. Calibration to population benchmarks helps to compensate for over- or under-enumeration of particular categories which may occur due to the random nature of sampling or non-response. This process can reduce the sampling error of estimates and may reduce the level of non-response bias.

ABS household surveys are calibrated to population benchmarks by state, part of state, age and sex. Initial person weights were simultaneously calibrated to population benchmarks for state by part of state, age, sex, state by household composition, state by educational attainment, and state by labour force status. Household weights were derived by separately calibrating initial household selection weights to the projected household composition population counts of households containing persons aged 16-85 years, who were living in private dwellings in each state and territory, excluding very remote areas of Australia, at 31 October 2007.

### **2.2.2 Data Collection**

Interviewers, trained by the Australian Bureau of Statistics (ABS), conducted interviews at selected private dwellings using a Computer-Assisted Interview (CAI) questionnaire, which involves the use of a notebook computer to record, store, manipulate and transmit the data collected during interviews. General characteristics of the household, basic demographic characteristics of all usual residents of the

dwelling (e.g. age and sex), and the relationships between household members (e.g. spouse, son, daughter, not related) were obtained from one person in the household aged 16 years or over on the first face-to-face contact with the interviewer. This person also answered financial and housing items, relating to income and tenure, on behalf of other household members, and from the information provided persons in-scope of the survey were identified and one person aged 16-85 years was randomly selected to be included in the survey. Survey interviews, including the household assessment, took an average of 90 minutes to complete.

### 2.2.3 Survey Response

17,352 private dwellings were initially selected for the survey. However, the sample was reduced to 14,805 dwellings due to the loss of households with no residents in scope for the survey or randomly selected dwellings were vacant, under construction or derelict. Of the eligible dwellings selected, there were 8,841 fully-responding households, representing a response rate of 60%. This was lower than expected. A low response rate can lead to a biased sample and create non-sampling error. Therefore, extensive non-response analyses were carried out to assess the reliability of the survey estimates. This included comparing population characteristics in the NSMHWB to other data sources and a small sample Non-Response Follow-Up Study (NRFUS). As a result of the analyses, adjustments were made to the weighting strategy.

### 2.2.4 Measuring Mental Disorders

To estimate the prevalence of specific mental disorders, the NSMHWB used the World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview, version 3.0 (WMH-CIDI 3.0). This is a comprehensive interview used to assess the lifetime, 12-month, and 30-day prevalence of selected mental disorders by measuring symptoms and their impact on day-to-day activities. It provides an assessment of mental disorders based on the definitions and criteria of two classification systems: the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV); and the WHO International Classification of Diseases, Tenth Revision (ICD-10). Both the DSM-IV and the ICD-10 have sets of criteria, necessary for diagnosis, which specify the nature and number

of symptoms required, the level of distress or impairment required, and the exclusion of cases where symptoms can be attributed to general medical conditions, such as a physical injury, or to substances, including alcohol. The WMH-CIDI 3.0 was also used to collect information on the course, onset, recency and persistence of symptoms of mental disorders, the impact of mental disorders on home, work, relationship and social functioning, and treatment seeking and access to adequate treatment. Advantages of using the WMH-CIDI 3.0 include its provision of a fully structured diagnostic interview, its ability to be administered by lay interviewers, its widespread use in epidemiological surveys, and its comparability with similar surveys conducted worldwide.

The chapters outlined in this thesis that have used NSMHWB data (Chapters 3 and 6) have focused on individuals diagnosed with lifetime Major Depressive Disorder with recent symptoms. To receive a diagnosis of Major Depressive Disorder a person must have met criteria for a single Major Depressive Episode. Major Depressive Disorder is characterised by the presence of five or more symptoms during the same two week period, with at least one of the symptoms from the first two on the list: depressed mood; loss of interest and pleasure; weight change or appetite disturbance; sleep disturbance; psychomotor changes; low energy; feelings of worthlessness or guilt; poor concentration or difficulty making decisions; or recurrent thoughts of death or suicidal ideation, plans or attempts. Presence of these symptoms must represent a change from previous functioning not accounted for by bereavement. The episode must also be accompanied by clinically significant distress or impairment in social, occupational, or other important areas of functioning.

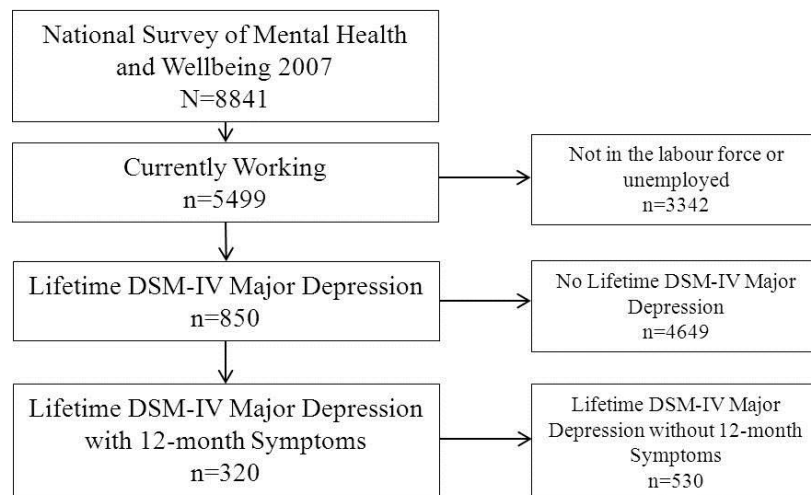
## **2.3 Study sample**

The National Survey of Mental Health and Wellbeing provided the samples for the studies reported in the following chapters:

### **2.3.1 Chapter 3**

The NSMHWB provided a sample of 320 employed individuals reporting lifetime major depression, with 12-month symptoms. That is, respondents who met criteria for DSM-IV Major Depressive Disorder, had reported experiencing symptoms of the

disorder in the 12-months prior to the survey interview, and were currently employed according to their answers to the Labour Force Status questions within the survey. The derivation of the sample is presented in Figure 2-1. The NSMHWB also provided the outcome, presenteeism, and predictor variables, various socio-demographic, work, financial and health factors, used in the analyses documented in this chapter.

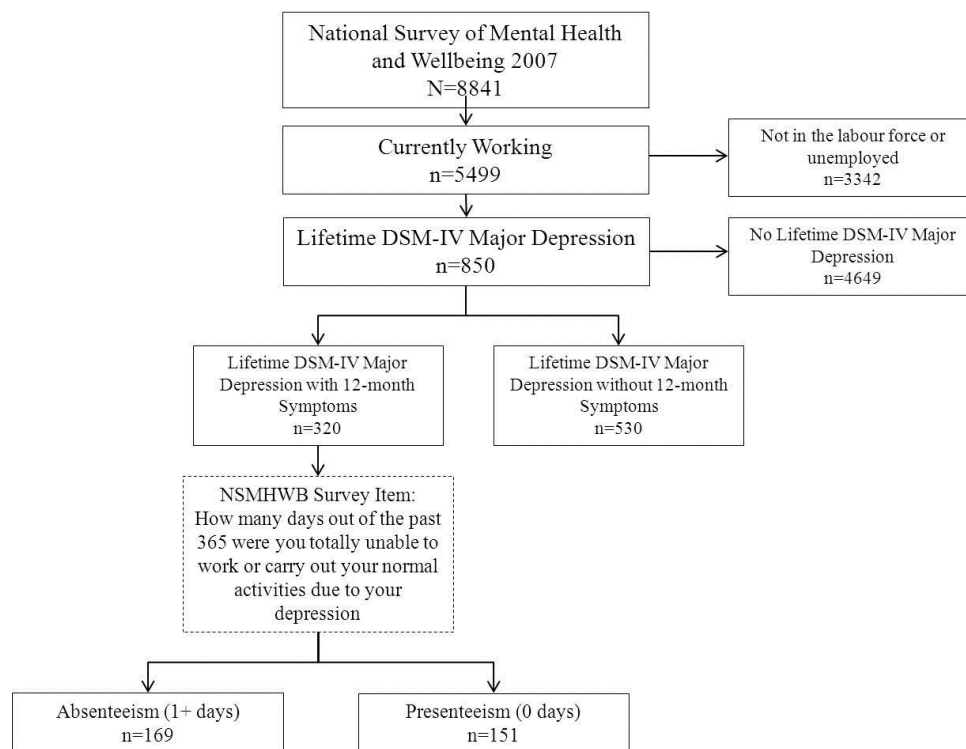


**Figure 2-1.** Study sample size derived from the 2007 National Survey of Mental Health and Wellbeing (NSMHWB).

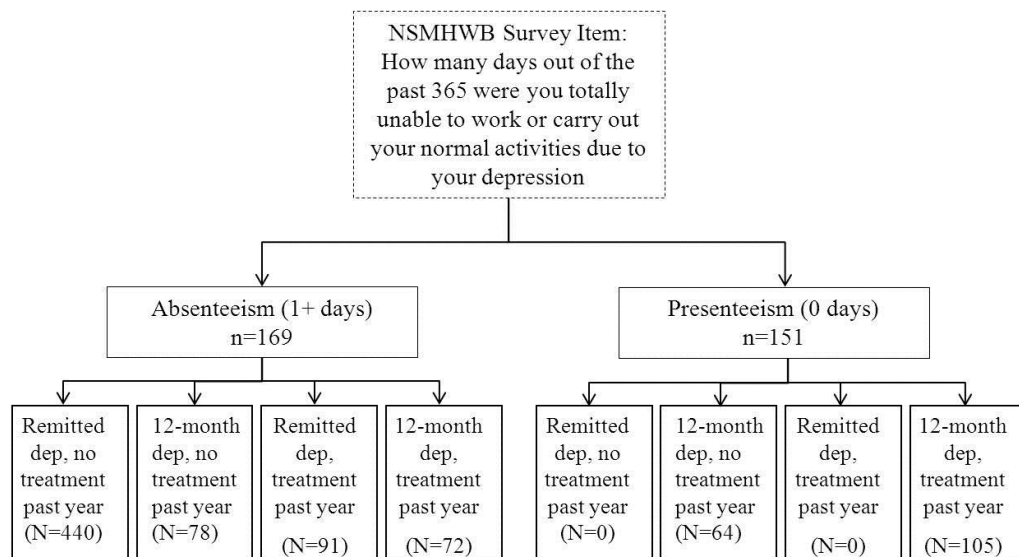
### 2.3.2 Chapter 6

In this chapter, an epidemiologic-based analytic modelling study was conducted using cohort simulation and state-transition Markov models to estimate the costs and health outcomes of working while experiencing depression versus taking a sickness absence. This method is described in detail in Chapter 6. The NSMHWB was the primary, epidemiological data source which provided the majority of probabilities and costs within the models and the hypothetical sample of employed Australian adults reporting lifetime major depression with and without 12-month symptoms, categorised by reported absenteeism and presenteeism and treatment status (Figures 2-2a, 2-2b). Specifically, the NSMHWB provided estimates of health service use, including number, length and cost of consultations, and estimates of antidepressants medication use.

The NSMHWB also provided the primary health outcomes used in this study, quality-adjusted life years (QALYs). QALYs are a combination of quality (measured using utilities) and duration of life. Utilities are a global measure of the value attached to each health state and ideal to capture the broad effects on health and wellbeing possible from presenteeism and absenteeism (3, 4). Utilities were from the NSMHWB (5) which used the Assessment of Quality of Life-4D (AQoL-4D) (6), a validated measure, able to detect subtle quality-of-life differences in areas including mental health (7, 8).



**Figure 2-2a.** Hypothetical cohort used in state transition Markov models described in Chapter 6, derived from the NSMHWB.



**Figure 2-2b.** Hypothetical cohort used in state transition Markov models described in Chapter 6, derived from the NSMHWB.

## 2.4 Study factors

### 2.4.1 Labour force status

A reduced set of questions from the ABS monthly Labour Force Survey were used to collect information on labour force status. Based on the information provided, individuals were classified as employed, unemployed, or not in the labour force. Only those classified as employed at the time of interview were included in the analyses outlined in Chapters 3 and 6. An employed person is a person who, during the survey reference week, had worked for one hour or more for pay, profit, commission or payment in kind, in a job or business or on a farm (comprising employees, employers and own account workers), had worked for one hour or more without pay in a family business or on a farm (i.e. contributing family workers), or were employers or own account workers who had a job, business or farm, but were not at work.

Further, based on the hours worked in all jobs, employed people were classified as either part-time or full-time workers, both of which were included in the analyses outlined in Chapters 3 and 6. Part time workers reported usually working less than 35 hours a week (in all jobs). Full time workers reported usually working 35 hours or more a week (in all jobs).

### 2.4.2 Work attendance behaviour

The outcome variable in the multivariable logistic regression analyses described in Chapter 3 was presenteeism, or attending work when ill. This was defined as the absence of absenteeism. In other words, no reported depression-specific, work- and role-functioning disability days in the 12-months prior to the survey interview in response to the NSMHWB, depression module item “About how many days out of 365 in the past 12 months were you totally unable to work or carry out your normal activities because of your (sadness/or/discouragement/or/lack of interest)?”.

Absenteeism, the converse, was used as the reference category in the analyses in this Chapter 3. Therefore, this analysis is based on two assumptions; a) all employed individuals with 12-month depression will experience impairment relevant to their work; and b) the categories of 12-month absenteeism and presenteeism are mutually exclusive. This method was selected as it provides a measure of depression-specific disability days and therefore removes the possible influence of co-morbid disorders of work attendance decisions.

### 2.4.3 Socio-demographic factors

Socio-demographic factors included sex (male, female), age, which was a continuous variable categorised for our analyses into 15-34 years, 35-54 years, 55+ years, marital status, a five level variable (never married, widowed, divorced, separated, married), categorised for our analyses as married or not married, number of children under the age of 17 (none, one, two, three or more), re-categorised as (none, any), and education (postgraduate degree/graduate diploma, bachelor degree, advanced diploma/diploma, certificate iii/iv, certificate i/ii, certificate not further required, no non-school qualification, level not determined), again re-categorised for our analyses as high-school only and post high school. In regards to the discussion of marital status in subsequent chapters, the term “romantic relationships” is used to describe committed relationships. The NSMHWB defined the level of highest non-school qualification as the highest level of educational attainment above secondary school (i.e. above Year 12). The level is determined through the Australian Standard Classification of Education (ASCED).



#### 2.4.4 Financial factors

Financial factors included tenure and financial difficulties. Tenure, which was re-categorised as renting or owning/other, was included as it provides an indication of the stability of the respondents living arrangements. For instance, a family may have better financial security if their house is owned outright, rather than being paid off. This information was derived from a NSMHWB item which asked respondents about the type of dwelling and whether the dwelling was i) being paid off; ii) owned outright; iii) being rented; or iv) being purchased under a rent/buy or shared equity scheme. If none of these options was appropriate the respondent was asked if they (or their spouse/partner/parent) i) occupied the dwelling under a life tenure scheme; ii) paid board; or iii) lived in the dwelling rent-free. Financial difficulties, categorised as yes or no, was determined by affirmative answers to any of a series of financial hardship items relating to seeking government assistance, ability to heat their home, payment of utility bills or car registration, need to pawn/sell belongings, going without meals or seeking financial assistance from friends/family.

#### 2.4.5 Work-related factors

Work-related factors included occupation type which was an 8-level variable (managers, professionals, technicians and trades workers, community and personal service workers, clerical and administrative workers, sales workers, machinery operators and drivers, labourers) grouped according to the Australian and New Zealand Standard Classification of Occupation (ANZSCO). During analysis ‘manager’ was used as reference category, consistent with existing literature (1). Work hours referred to “usual hours worked per week”. Three levels (1-34 hours, 35-40 hours, 41 or more hours) were used. Further, based on the hours worked in all jobs, employed individuals were classified as part-time workers, those who less than 35 hours a week (in all jobs), or full-time workers, employed people who usually worked 35 hours or more a week (in all jobs). During analysis the reference category was 35-40 hours as the majority of working Australians occupy this group.

#### 2.4.6 Health factors

Health factors included severity and recency of depression symptoms. The severity measure included in the NSMHWB assessed the impact a mental disorder has on a

respondent via an attributed level of impairment. In the WMH-CIDI, the Sheehan Disability Scale is administered in each diagnostic section to measure the disorder-specific severity of 12-month symptoms. In the analyses outlined in Chapter 3, depression-specific clinical severity scales were used for individuals diagnosed with a lifetime mental disorder who reported experiencing symptoms in the 12 months prior to survey interview, the level of the severity of their impairment was calculated based on the endorsement of particular questions in the survey interview. Responses to these questions provided an overall indication of the severity of impairment, by the following three levels: severe; moderate; or mild.

A respondent was considered to have a severe level of impairment if any one of the following occurred in the 12 months prior to interview: i) a diagnosis of Bipolar I Disorder; ii) Substance Dependence with serious role impairment (two effects experienced 'a lot'); iii) a suicide attempt and any mental disorder; iv) at least two areas of severe role impairment in the Sheehan Disability Scale domains because of a mental disorder; or v) overall functional impairment at a level found in the National Comorbidity Survey Replication (NCS-R) to be consistent with a Global Assessment of Functioning (GAF) Score of 50 or less, in conjunction with a mental disorder. Moderate impairment was if a respondent was not classified as severe; reported at least moderate interference in any Sheehan Disability Scale domains; or had Substance Dependence without substantial impairment. Finally, mild impairment was if a respondent was not classified as severe or moderate. For the analyses outline in Chapter 3, severity was a two-level variable (mild/moderate, severe/very severe).

Recency of symptoms was determined by asking the respondent their age the last time they had a particular symptom or episode. Questions about onset (first time) and recency (last time) were asked for each group of symptoms that may have corresponded to a diagnosis of mental disorder. Therefore, if a person had experienced symptoms or an episode in the 12 months prior to interview they were asked how recently this occurred. Responses were categorised as: i) within the month prior to interview; ii) two months to six months prior to interview; or iii) more than six months prior to interview. In the analysis outline in Chapter 3, recency is categorised as past month vs. longer.

Other health related factors included receipt of depression-specific treatment, antidepressant use, co-morbid mental disorders, and self-assessed health.

Antidepressant medication use was categorised for the analyses described in Chapter 3 as 'yes' or 'no'. Within the NSMHWB, respondents were asked about the types of medications they had used for their mental health in the two weeks prior to interview. Up to five types of medication could be recorded. Medications included those being used for preventive health purposes, as well as for mental disorders, and may have included vitamins or mineral supplements, herbal or natural treatments/remedies; and pharmaceutical medications. Respondents also reported the number of medications taken for their mental health, the length of time they had been taking the medication, and whether they usually took the medication according to the recommended dose. Comorbidity referred to the occurrence of more than one disorder at the same time. Comorbidity may refer to the co-occurrence of mental disorders and the co-occurrence of mental disorders and physical conditions. The NSMHWB provided information on comorbidity, both in terms of the number of disorders, and the combinations of different types of comorbidity.

Within the analysis outlined in Chapters 3 and 6 'in treatment' was defined as contact with a health professional, i.e. general practitioner, psychologist or psychiatrist, for depression in the 12-months prior to the survey interview. Treatment was a dichotomous variable (yes/no). This information was derived from the NSMHWB module on Health Service Utilisation. Health service utilisation relates to services used for mental health problems in the 12 months prior to interview. For each specific mental disorder, information was collected about the type of treatment individuals sought and received. Respondents were asked whether they had ever talked to a medical doctor or other professional about symptoms previously identified (e.g. sadness, discouragement, and lack of interest). The types of professionals included psychologists, social workers, counsellors, herbalists, acupuncturists, and other healing professionals. Specifically, individuals were asked whether they had ever had consultations with the following types of health professionals: general practitioner (GP), psychiatrist, psychologist, mental health nurse, other professional providing specialist mental health services such as a social worker, counsellor or an occupational therapist, specialist doctor or surgeon, other professional providing general services, or a complementary/alternative therapist such as a naturopath. If they had consulted one of the aforementioned professionals

individuals were then asked to identify, for the 12 months prior to interview, the number of consultations for physical and/or mental health, the average length of time (in minutes) for these consultation/s, the method of payment for the consultation/s, their 'out of pocket' expenses, whether they had received a referral from a GP for the consultation and finally whether they had ever been hospitalised overnight for their symptoms.

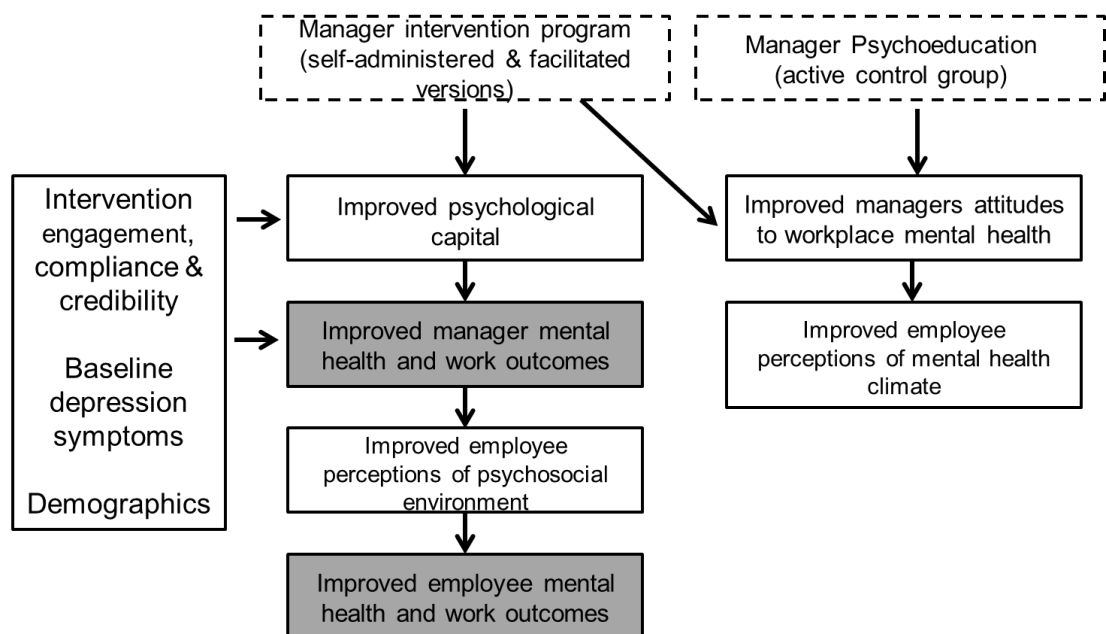
The final health-related factor in Chapter 3 derived from the NSMHWB was self-assessed mental and physical health (excellent/very good/good, fair/poor) were each derived from two NSMHWB items which assessed current state of mental and physical health on a 1-5 scale from excellent to poor. Self-assessed physical and mental health has been validated as a measure of general health status in various populations (9, 10). It is related to important health outcomes including health risk behaviours, disability and mortality (9), demonstrates good reliability and reproducibility (11).

#### 2.4.7 Standard error calculation

Due to the complex survey design employed in the NSMHWB, the standard errors presented in Chapter 3 and in the sensitivity analysis in Chapter 6 were calculated using replication methods, specifically Jack knife delete-2 survey adjustment techniques (12). This process accounted for the aforementioned, stratified multistage sampling framework used in the NSMHWB and adjusted for non-response, which may cause some groups to be over- or under-represented (13). The theory behind replication methods is that, in random samples, the variability between repeated samples (which defines the sampling variance) can be simulated by repeatedly taking random, but unbiased, sub-samples (or 'replicates') from the achieved sample and then measuring the variability between these sub-samples (after taking into account the smaller sample size). Jack-knife estimation replicates are created by removing one population sampling unit (PSU) from the dataset at a time and then weighting up the other PSUs from the same stratum to adjust for the removal. In this way, each replicate gives an unbiased estimate of the population mean, and the variance between the replicate means gives an estimate of the true sampling variance.

## 2.5 Business in Mind

Data from the evaluation of the Business in Mind program was used in Chapter 5. The Business in Mind program is a mental health promotion intervention designed to enhance the mental health of small-to-medium enterprise (SME) owner/managers. The Business in Mind research project was set up to evaluate the efficacy of the program and investigate the processes by which managers' psychological state affects the wellbeing of their employees via the workplace psychosocial environment. The Business in Mind project also aimed to calculate the cost-effectiveness of the intervention in order to guide future policy development and decision-making by relevant research partners, business stakeholders and government bodies. In summary, the Business in Mind project was set up to test the theoretical model shown in Figure 2-3 below (14).



**Figure 2-3.** Business in Mind proposed theoretical model.

### 2.5.1 Research Design

The research design employed a three arm randomized controlled trial in a sample of owner/managers of SMEs (14). The trial will also be evaluated using a sample of employees of the participating managers. Measurements are scheduled at baseline, directly after completion of the intervention, and at 6 months follow up. After this time the managers in the control group will be offered the intervention on a self-

administered basis. Longer-term follow up measures at 12 and 24 months post intervention will examine changes in managers' risk for depression and the potential for the intervention to 'inoculate' them during significant work or life challenges. At the time this thesis was written, recruitment into the Business in Mind project was ongoing. Some participants were at the point of completing their 6-month follow up survey, but none had reached the 12 or 24 month follow up point. Analyses reported in Chapter 5 of this thesis uses baseline data only.

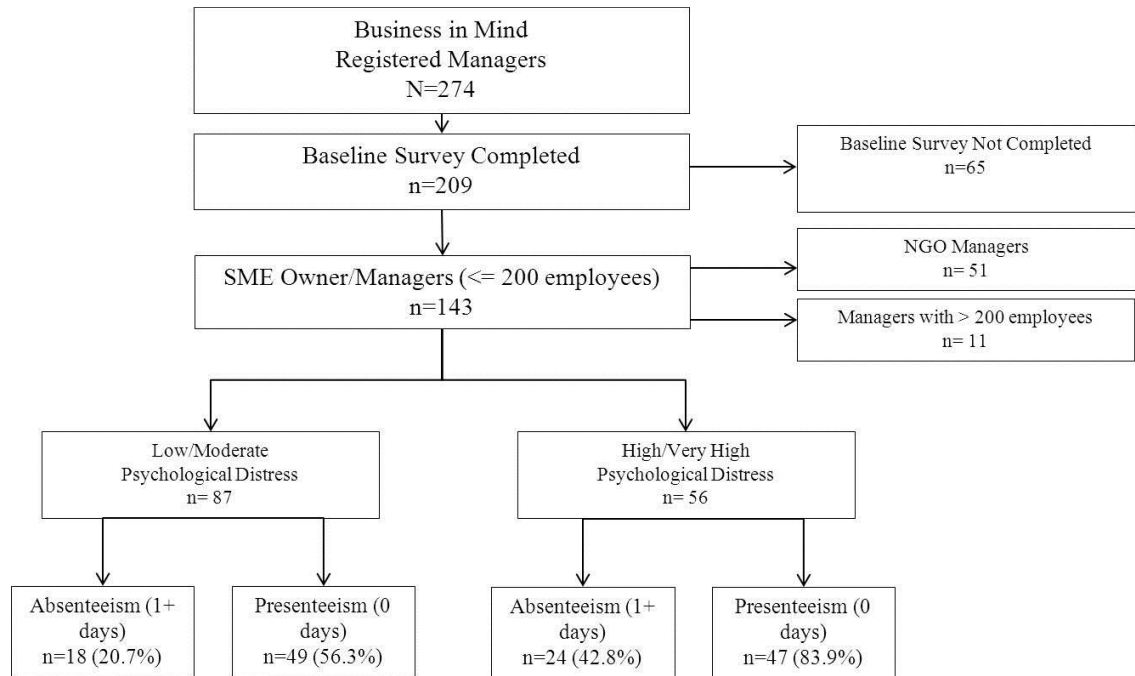
### **2.5.1 Intervention details and treatment allocation**

All participants who met the basic inclusion criteria, individuals over 18 years of age, in a managerial role within a business employing less than 200 employees who had access to a telephone and computer/DVD player, were eligible for assignment after informed consent was received. After registering to participate, SME owner/managers were randomly assigned by a computer to the experimental or control conditions. The two experimental conditions were the self-administered group, who received the 'Business in Mind' DVD and accompanying guidebook, and the telephone-facilitated group, who received six, thirty-minute telephone calls over three months, in addition to the program materials. The intervention consists of the 'Business in Mind' DVD program that shows business owners sharing their work experiences and demonstrating their skills, and an accompanying guidebook that contains structured tasks and handouts that help participants apply the ideas presented in the DVD to their situations. The control group was set up as an “active” control in that these participants received a briefer DVD (15 minutes) and a folder of resources adapted from material delivered in beyondblue's workplace training program, designed to help managers to identify common symptoms of depression in themselves or those under their supervision, and promote help-seeking and early intervention.

## **2.6 Study sample**

In Chapter 5, analyses have been conducted using data derived from the baseline sample of the Business in Mind program. Specifically, Business in Mind provided a sample of 143 SME owner/managers (Figure 2-4). Univariable logistic regression

analysis were conducted on a sub sample of these owner/managers who met criteria for high psychological distress (n=50), as measured by the Kessler 10 (K10) Screening Scale for Psychological Distress. Further information on the recruitment and sampling of Business in Mind participants is provided in Chapter 5.



**Figure 2-4.** Study sample derived from the baseline phase of Business in Mind.

## 2.7 Study factors

Business in Mind baseline data provided estimates of K10 psychological distress in order to classify participating SME owner/managers as experiencing low/moderate or high/very high psychological distress. Baseline data also provided the outcome and predictor variables used in the analyses reported in Chapter 5.

### 2.7.1 Psychological Distress

The Kessler 10 (K10) Screening Scale for Psychological Distress was used to measure current psychological distress of participating owner/managers during the 4 weeks prior to the completion of the baseline questionnaire. The K10 consists of ten questions about non-specific psychological distress. For example, “In the past four weeks, how often did you feel tired out for no good reason” and “In the past, how often did you feel nervous”. Each item is measured on a five-level response scale

based on the amount of time the respondent reports experiencing the particular problem i.e. none of the time (1), a little of the time (2), some of the time (3), most of the time (4), and all of the time (5). Scores of the ten items are summed, yielding a minimum possible score of 10 and a maximum possible score of 50. Low scores indicate low levels of psychological distress and high scores, high levels of psychological distress. A set of cut off scores used for the 2000 Health and Wellbeing Survey (conducted in Western Australia), and the Australian Bureau of Statistics' (ABS) 2001 National Health Survey, to estimate levels of psychological distress (15, 16) were used to determine low (10-15), moderate (16-21), high (22-29) and very high (30-50) psychological distress within the sample.

The K10 was developed based on extensive psychometric analyses, in large general population samples, and using modern item response theory methods to maximize the scale's precision and ensure each item in the scale had consistent severity across socio-demographic subsamples (17). It is regularly used in population health surveys to measure psychological distress and has greater discriminatory power in detecting DSM-IV depressive and anxiety disorders than other short general measures, such as the General Health Questionnaire (GHQ-12) (18). Research has also revealed a strong association between high scores on the K10 and a current CIDI (Composite International Diagnostic Interview) diagnosis of anxiety and affective disorders (15). Specifically, individuals who scored 30-34, 35-39 or 40-50 on the K10, indicative of very high psychological distress, had a 54.2%, 62.5% and 73.2% probability respectively of meeting criteria for a current DSM-IV affective disorder (19).

### 2.7.1 Absenteeism, presenteeism and lost productive time

The outcome variables in the univariable logistic regression analyses conducted were absenteeism and presenteeism days. Absenteeism days were measured using an item from the World Health Organizations Health and Work Performance Questionnaires (HPQ). Specifically, "In the past 4 weeks, on how many days did you miss a whole day of work because of problems with your physical or mental health?" (20, 21). HPQ validation studies show good concordance between measures of self-reported absenteeism and pay-roll records over a 30-day recall period (20, 22). Further, these types of recall-based questions have been typically used in previous studies to establish absenteeism rates for mental disorders (23). Using this question also



allowed the examination of the correlates of absenteeism amongst owner/managers with high psychological distress as a continuous (number of days) and a dichotomous (none/any) measure.

The presenteeism measure, like the absenteeism measure, had a 4-week recall period. The first presenteeism measure determined the number of days an owner/manager attended work while suffering from a health problems/s (presenteeism days). This was assessed by the item “How many days in the last 4 weeks did you got to work while suffering from health problems?” (24). Owner/managers also provided a self-reported estimate of lost productive time associated with their presenteeism days, on a vertical scale from 0-100%, in answer to the item “On these days, when you went to work suffering from health problems, what percentage of you time were you as productive as usual?” Therefore, the measure of presenteeism days could be adjusted by a percent rating of perceived productivity (25) to estimate lost productivity from being at work when sick (26). Self-reported presenteeism has been shown to have a good level of agreement with independent ratings of work performance such as supervisor or peer ratings (22, 27). Further, these measures have been validated in population of employed, individuals reporting symptoms of depression and anxiety (28). The correlates of presenteeism as a continuous (number of presenteeism days) and dichotomous (none/any) measure were examined.

Predictor variables included various socio-demographic, work-related wellbeing, and health-related factors as well as individual and business characteristics were also derived from the baseline Business in Mind data. These are explained in detail in Chapter 5.

## **2.8 Cognitive Interviewing Study**

Using cognitive interviewing techniques, this study aimed to evaluate the validity of the Team Production Interview (Appendix A) (29-31) and its useability amongst managers. The study explored the cognitive processes underlying manager’s responses, identify difficulties and their causes and suggest design solutions to produce a more comprehensible measure of presenteeism and more reliable valuation of related lost productive time.

## **2.9 Study sample**

Twenty managers (12 women, 8 men) were recruited via invitations to postgraduate management students ( $n=6$ ) and snowballing referral from those already enrolled ( $n=14$ ). Eligibility was based on recent management experience, defined as: i) budget responsibility; ii) at least two supervisees; iii) Australian business experience; iv) occupation of a management role within the last year, for a minimum of 12 months. Most had occupied their current position for at least 2 years ( $M=9$ ,  $SD=6.4$ ). A variety of industries were represented and organisation size ranged from 3 to 24,000. Participation was voluntary and informed consent obtained. A sample of 20 is deemed adequate in cognitive interviewing for identifying major problems relating to survey design, structure, item interpretation and response (32).

The sample used in this study was a convenience sample. Although there are known disadvantages of using convenience samples, such as the inability to make generalisations from the sample to the general population, their use is also relatively cost and time efficient in comparison to probability sampling techniques. As this study required only a small sample to achieve its objectives this relatively fast and inexpensive sampling technique was ideal. Further, convenience samples are regularly used in cognitive interviewing (33, 34).

### **2.9.1 Cognitive interviewing: The specifics**

Survey researchers who apply cognitive interviewing techniques recognize that they cannot know in an absolute sense what transpires in a respondent's mind as he or she answers a survey question. Rather, the cognitive interviewer's goal is to prompt the individual to reveal information that provides clues as to the types of processes mentioned above. The manner in which one may go about this is discussed next.

There are two main kinds of cognitive interviewing techniques: 1) think-aloud, in which respondents are encouraged to think aloud as they provide their responses to the survey items, and 2) verbal probing, in which the interviewer "probes" into the basis or reason for the respondents answer by following the survey item with several

related questions. Both techniques have their advantages and disadvantages. Think aloud techniques allow freedom from interview-imposed bias, and require minimal interviewer training. However, respondents may be resistant to this technique as it places additional burden on them. It may also encourage respondents to stray from the task and bias their information processing. Advantages of verbal probing include the additional control it affords to the interviewer during the interview process and the ease with which respondents can be trained as the probes tend to be similar to the survey items they are already answering. Disadvantages include the possibility of artificiality in the respondents' answers and the potential for bias introduced by the interviewer. However, such bias can be minimized by selecting of "non-leading" probing techniques. For example, Willis (1999a) urges interviewers to probe rather than suggest possibilities to the respondents. That is, instead of suggesting the answer to the respondent e.g. "Did you think the question was asking just about physicians?" it is better to list all possibilities e.g. "Did you think the question was asking only about physicians, or about any type of health professional?".

Verbal probing is used more frequently than think aloud techniques and there are two common approaches: concurrent and retrospective. The latter is beneficial when testing self-administered questionnaires and in later stages of questionnaire development. However, concurrent probes are more commonly used. Probes can be scripted, spontaneous or a combination of both. Scripted probes are prepared prior to the interview and ideal if there is adequate preparation time and in situations when the interviewer is inexperienced. They also allow for greater standardisation. In contrast, spontaneous probes cannot be completely planned prior to the interview and are created on the spot by the interviewer. Therefore, they are considered more disorganized and can lead to a unique, and potentially biased, relationship developed in each interview between the subject, interviewer and questionnaire (32).

In terms of specific categories, probes that can be used there are comprehension or interpretation probes, paraphrasing, confidence judgment, recall, specific and general probes. Comprehension or interpretation probes ask the respondent to clarify what certain items, or parts thereof, mean to them in order to identify when a respondent does not understand what the question is asking, or when the respondent has identified alternate interpretations of a question. Paraphrasing probes, which ask the respondent to repeat the questions they have been asked in their own words, are also

employed for this purpose. Such probes are useful to identify which questions fail to draw out the type of information for which the survey was designed. Recall probes aim to determine which items respondents are unable to recall sufficient information to provide a precise answer to. Finally, confidence judgement probes are designed to test how sure a respondent is that they have provided an accurate response (32).

## **2.10 Ethics**

Informed consent was obtained from all Business in Mind participants (Chapter 5) and those who took part in the cognitive interviewing study (Chapter 7). The study protocols for both projects were approved by the Human Research Ethics Committee (TAS), which is a joint agreement between the University of Tasmania and the Department of Health and Human Services (DHHS) (Business in Mind Ethics Ref No: H0010439; cognitive interviewing study Ethics Ref No: H0010146).

Ethics approval was not required for the studies described in Chapters 3 or 6 as they used data that was non-identifiable and conducted in accordance with ABS data release policies.

## **2.11 Data analysis**

Methods of data analysis for each individual study are reported in the relevant chapters of this thesis that details the conduct and results of that study.

## **2.12 Postscript**

This chapter provides detailed information on the methods for collecting data on absenteeism, presenteeism and inefficiency amongst various samples of employed individuals reporting depression and psychological distress and the primary and secondary data sources from which these samples were derived. It mentioned the quality epidemiological data source, the National Survey of Mental Health and Wellbeing, and explained the weighting strategies employed to ensure that data and findings derived from this survey are generalisable to the total in scope population.

In the next chapter, data derived from the NSMHWB is used to investigate the correlates of presenteeism amongst employed Australians reporting lifetime major depression with 12-month symptoms and findings can be generalised to individuals within the Australian working population experiencing depression.

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## **Chapter 3. Factors associated with presenteeism amongst employed Australian adults reporting lifetime major depression with 12-month symptoms.**

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### **3.1 Preface**

In this chapter, I explored the work, non-work and health-related correlates of presenteeism amongst a sample of employed Australian adults reporting lifetime major depression with 12-month symptoms. This work is important because little is known about the factors associated with these behaviours, within this population. This study aimed to determine the relative importance of socio-demographic, financial, work and health-related factors associated with presenteeism. The identified associations between socio-demographic, financial and health factors on work attendance behaviours could be used inform disease management guidelines for employers via recognition of employees at risk of presenteeism.

The material presented here has been published in a peer-reviewed journal (1).

### **3.2 Introduction**

Depression is common in the working population. The 12-month prevalence of major depression was 5.8% and 6.4% amongst Australian and US workers respectively (2, 3). Consequently, much of the economic consequences of major depression are borne by the workforce.

While actively engaged in the workforce, employed individuals experiencing depression can take a sickness absence or continue working when ill (presenteeism). Both are potentially costly due to declining productivity. Annual direct and indirect costs of depression-related work attendance behaviour exceed \$18.2 billion (USD), 15.1 billion UK pounds (4) and \$12.6 billion Australian dollars (5), and are attributable to work impairment, disability and lost productive time (6). Most studies measuring the economic impact of absenteeism and presenteeism report presenteeism creates the higher cost burden (3, 7, 8), accounting for 80% of costs alone (6). Moreover, presenteeism costs are consistently higher than health care costs for most conditions, including depression (7). This is most likely due to the fact individuals

reporting depression often continue working and are more likely to do so than workers experiencing other chronic health conditions (6, 9-11).

Absenteeism and presenteeism behaviour also has negative health effects, although no study has explored these amongst employees reporting depression. Poorer general health has been observed amongst absenteeism reporters (12), whilst Kivimaki (2005) (13) found presenteeism reporters had a 50% increase in incidence of coronary events compared to those who take time off, and an increased risk of long-term sickness absence. The latter finding is supported by the identified “health-protective” effect of small amounts of sick leave (14). One explanation for these outcomes is presenteeism leads to a build-up of stress and allostatic load (12) when individuals do not take required recovery time (15). Increased allostatic load has been associated with accelerated disease processes, unhealthy behaviours such as smoking and excess alcohol consumption (16), and an increased risk of cardiovascular disease (15). Sickness presenteeism may accentuate the strain an individual is experiencing and failure to manage an illness in its early stage may prompt a more severe disease and greater health and economic consequences.

Investigation of the health and economic consequences of depression-related absenteeism and presenteeism, and identification of work and non-work factors associated with these work attendance behaviours is necessary to better understand them and develop a profile of the individuals likely to engage in them.

Organisational policies, health and life events (17), personal circumstances and attitudes have received attention regarding their ability to influence work attendance. However, presenteeism has been less studied compared to sickness absenteeism; fewer studies focus on the determinants of continued work attendance, despite its recognised impact.

Organisational factors and policies including the absence of sick leave (18), and casual or contingent employment, are associated with increased presenteeism (19) as are difficult to postpone tasks, time pressure, reliance on teamwork, and long hours (20-22). Welfare, teaching occupations (20), or jobs with supervisory responsibilities are associated with higher rates of presenteeism, due to perceived duty to clients, colleagues, or students. Finally, attitudes towards absenteeism (23) and personality

attributes such as conscientiousness, psychological hardiness and over-commitment (24) influence work attendance behaviour (18).

A recent systematic review (25) identified 30 studies exploring factors associated with absenteeism and presenteeism among depressed workers and found the majority of studies reported on relationships with disorder-related factors. Personal or work-related factors were addressed less frequently, highlighting the need for more thorough investigation of the association between potentially modifiable factors within this population. Furthermore, no study has investigated the relative importance of socio-demographic, financial, work and health-related factors compared to other factors for presenteeism, or the degree to which depression-specific factors influence an employee's behaviour. Understanding the relative association of work and non-work characteristics with work attendance behaviours may identify which factors may be amenable to change and/or intervention, potentially improving illness management through the development of informed practice guidelines. Workplace practices which support employees experiencing depression and provide access to evidenced-based care could improve workers' quality of life and reduce costs to employers associated with absenteeism, disability and lost productivity (26).

Using data from a large national mental health survey, (2), this study aimed to determine which factors are associated with depression-specific presenteeism and the relative importance of socio-demographic, financial, work and health-related factors. In doing so we hope to develop a profile of individuals likely to continue working when sick in order to identify whom to target in workplace health promotion and intervention programs, as well as make informed recommendations as to what these programs could improve the management of employees experiencing depression.

### **3.3 Methods**

#### **3.3.1 Subjects**

Cross sectional, population-based data (n=8841) from the NSMHWB identified employed individuals reporting lifetime major depression, with symptoms in the past 12-months (N=320) (2).

### 3.3.2 Data

The NSMHWB is a stratified, random household survey conducted by the Australian Bureau of Statistics (ABS). It was designed to provide updated lifetime prevalence estimates of affective, anxiety, and substance abuse disorders within the Australian population, using the Composite International Diagnostic Interview (3.0) (3). Twelve-month diagnoses were based on lifetime diagnosis and the presence of symptoms in the 12-months prior to the survey interview.

Information was collected about impairment and severity associated with common mental disorders and related service utilisation, physical conditions, social networks and care-giving, demographic and socio-economic characteristics. A response rate of 60% was achieved, representing a projected Australian adult resident population of 16,015,300. Survey weights accounted for the probability of an individual household's members being selected and to comply with the age and sex distribution of the Australian population. Weights were calibrated to population benchmarks for state by part of state (rural/urban), age and sex, state by household composition, state by educational attainment and state by labour force status and survey results were adjusted accordingly, to infer findings for the Australian adult population.

### 3.3.3 Outcome variable

The outcome of interest was presenteeism defined as the absence of absenteeism (13) in the context of reported depression symptoms. That is, no depression-specific, work- and role-functioning disability days in the 12-months prior to the survey interview in response to the NSMHWB, depression module item "About how many days out of 365 in the past 12 months were you totally unable to work or carry out your normal activities because of your (sadness/or/discouragement/or/lack of interest)?" Absenteeism, the converse, was used as the reference category in the analyses.

### 3.3.4 Predictors Variables

Socio-demographic factors: Variable selection was informed by existing literature reporting associations with either absenteeism or presenteeism (11, 24). Thus, sex

(male, female); age (15-34 years, 35-54 years, 55+ years); marital status (married, not married); education (high-school only, post high school) and number of children (none, any) were included

### 3.3.5 Financial factors

Housing tenure (renting, owning/other) was used as a proxy measure of economic position as home owners have a higher median income (27). It may be indicative of the stability of an individual's living arrangements. Financial difficulties (yes/no) were determined by affirmative answers to any of a series of financial hardship items relating to seeking government assistance, ability to heat their home, payment of utility bills or car registration, need to pawn/sell belongings, going without meals or seeking financial assistance from friends/family.

### 3.3.6 Work-related factors

Workforce status (employed, not employed, not in the labour force) was self-reported. Respondents participating in full or part time work were considered actively employed. Occupation type was an 8-level variable grouped according to the Australian and New Zealand Standard Classification of Occupation (ANZSCO): i.e., managers; professionals; technicians and trades workers; community and personal service workers; clerical and administrative workers; sales workers; machinery operators and drivers; and labourers (2). During analysis 'manager' was used as reference category, (28). Work hours referred to "usual hours worked per week". Three levels (1-34 hours, 35-40 hours, 41 or more hours) were used and the reference category was 35-40-hours consistent with the majority of working Australians.

### 3.3.7 Health factors

Depression characteristics included were severity and recency of depression symptoms. Severity was a two-level variable (mild/moderate, severe/very severe) derived from the NSMHWB depression module item which asked respondents about the severity of their emotional distress during periods of sadness, discouragement or disinterest. Responses were initially categorised as mild, moderate, severe and very severe. Recency (past month vs. longer), referred to how recently an individual had

experienced depression symptoms. Receipt of depression-specific treatment and antidepressant was investigated using a dichotomous variable (yes/no). 'In treatment' was defined as contact with a health professional, i.e. general practitioner, psychologist or psychiatrist, for depression in the 12-months prior to the survey interview. Antidepressant medication use (yes/no) referred to the past 2-weeks.

Self-assessed mental and physical health (excellent/very good/good, fair/poor) were each derived from two NSMHWB items which assessed current state of mental and physical health on a 1-5 scale from excellent to poor. Self-assessed health has been validated as a measure of general health status in various populations (29, 30). It is related to important health outcomes including health risk behaviours, disability and mortality (30), demonstrates good reliability and reproducibility (31), 2006), and correlates well with other measures of health (32).

Co-morbid mental disorders (none, any) and co-morbid physical disorders (none, any) were also measured. These were created using composite variables derived from a series of items in the NSMHWB depression and chronic conditions modules. Within these modules respondents were asked whether they had experienced the co-occurrence of depression and another mental disorder and the co-occurrence of their depression with any physical condition, or conditions, in the 12-months prior to the survey interview.

### 3.3.8 Data analysis

The Australian Bureau of Statistics provided the data as a Confidentialised Unit Record File (CURF). Jack knife delete-2 survey adjustment techniques were used to derive accurate standard errors (33). This process accounts for the stratified multistage sampling framework used in the NSMHWB and adjusts for non-response, which may cause some groups to be over- or under-represented (See Teeson, 2009) (34).

Factors identified from the literature as potential predictors of presenteeism were selected for further analysis using univariable logistic regression analysis. Those significant at the  $p < 0.25$  level were considered eligible for entry into the model (35). Additional, relevant variables were included regardless of statistical significance, to

control for potential confounding (36). The 0.25 level was chosen as the screening criterion for variable selection in accordance with Hosmer and Lemeshow's (2000) recommendation which suggests using a "more traditional level (such as 0.05)" may not identify variables of importance (35).

Eligible variables were entered sequentially into a multivariable logistic regression model. Wald tests assessed the statistical significance of each individual factor and groups of factors following their entry into the model. The predictive capabilities of each model were assessed after each new factor and groups of factors were entered, using the following (grouped) order: socio-demographic, financial factors (age, sex, marital status, housing tenure), work (occupation, hours) and health factors (self-assessed mental & physical health, severity, treatment and co-morbid mental disorders). The Receiver Operator Characteristic (ROC) curve determined the models' ability to categorize those subjects who experienced presenteeism.

Socio-demographic factors were entered first due to their ability to act as control variables and ensure effects attributed to the addition of the subsequent groups were not due to the demographic differences with which they are correlated (37). Marital status and housing tenure were included due to their association with age. Work factors preceded depression-specific health factors as they are known to effect mental health outcomes. Depression-specific health factors were entered last as their association with work attendance behaviours within this population and their relative contribution to the model's predictive capabilities are arguably the most novel premise being investigated in this study.

## **3.4 Results**

### **3.4.1 Prevalence of Sickness Presenteeism**

Table 3-1 contains the distribution (N, %) of absenteeism and presenteeism reporters by socio-demographic, financial, work and health factors. Of employed individuals reporting lifetime major depression with 12-month symptoms (N=320), 49.7% (N=151) reported presenteeism.

**Table 3-1** Employed individuals with lifetime major depression by absenteeism or presenteeism and socio-demographic, financial stress, work and health factors.

Employed, with lifetime major depression and 12-month symptoms (N=320)					
Absenteeism			Presenteeism		p (chi square value)
	n	%	n	%	
Socio-Demographic/Financial Stress Factors					
Age					
15-34 years	72	55.8	52	44.2	0.37
35-54 years	85	46.7	76	53.3	
55+ years	12	38.8	22	61.2	
Sex					
Male	60	45.6	64	54.4	0.47
Female	109	53.2	86	46.8	
Marital Status					
Not currently married	135	58.4	102	41.6	0.02
Married	34	32.8	48	67.2	
Education					
Non-school qualification	116	52.6	103	47.4	0.33
No non-school qualification	53	44.2	47	55.8	
Children					
None	118	53.0	104	47.0	0.28
Any children	51	43.5	46	56.5	
Housing Tenure					
Home owner	90	41.8	96	58.2	0.02
Renting	79	62.7	54	37.3	
Financial Difficulties					
No	106	46.5	112	53.5	0.26
Yes	63	62.4	38	37.6	
Work Factors					
Occupation					
Managers	17	44.3	20	55.7	0.25
Professionals	44	61.5	36	38.5	
Clerical/Admin Workers	24	34.8	28	65.2	
Community, Personal/Sales	40	65.7	15	34.3	
Technical/Trades	20	47.9	21	52.1	
Operators/Drivers/Labourers	22	42.0	30	58.0	
Work Hours					
1-34 hours	68	50.2	58	49.8	0.23
35-40 hours	61	59.5	44	40.5	
41 hours or more	40	38.2	48	61.8	
Health Factors					
Co-morbid Physical Conditions					
None	58	21.9	64	24.5	0.76
Any	111	78.1	86	75.5	
Treatment (12months)					
No treatment	64	42.7	78	57.3	0.12
Treatment	105	55.8	72	44.2	



**Table 3-1 cont.**

Severity					
Mild/Moderate	39	37.2	55	62.8	0.05
Severe/Very Severe	130	56.4	95	43.6	
Recency					
No past month symptoms	102	52.1	93	47.9	0.49
Past month symptoms	67	46.1	57	53.9	
Antidepressant Use					
No	121	48.8	123	51.2	0.70
Yes	48	53.0	27	47.0	
Co-morbid Mental Conditions					
None	29	32.7	54	67.3	0.11
Any	140	55.7	96	44.3	
Co-morbid Physical Conditions					
None	58	44.4	64	55.6	0.36
Any	111	53.7	86	46.3	
Self-assessed Mental Health					
Excellent/Very/Good	81	40.9	98	59.1	0.01
Fair/Poor	88	61.2	52	38.8	
Self-assessed Physical Health					
Excellent/Very/Good	115	46.2	120	53.8	0.19
Fair/Poor	54	59.4	30	40.6	

### 3.4.2 Factors associated with depression-related presenteeism

Univariable regression analyses (Table 3-2) revealed marital status, housing tenure, co-morbid mental conditions and self-assessed mental health were significantly associated with presenteeism. Married employed individuals were almost three times more likely to report presenteeism. Home owners were more likely to report presenteeism than renters. Likewise, employees with no co-morbid mental conditions and reporting excellent, very good or good self-assessed mental health were more likely to attend work when ill. Although not significant at the  $p < 0.05$  level, trends were observed for employees experiencing mild or moderate depression symptoms and those working longer than 41 hours a week to report attending work when ill.

The variables selected for inclusion in the multivariable model were grouped as socio-demographic and financial factors (age, sex and marital status, housing tenure); work factors (hours and occupation); and health factors (severity of depression symptoms, treatment, co-morbid mental disorders and self-assessed mental and physical health). Using these grouped factors, a sequential logistic regression analysis was used to predict presenteeism. Adjusted Wald tests followed each step to test whether the factors were simultaneously equal to zero and thus did not substantially improve the fit and predictive power of the model.

**Table 3-2** Univariable regression analyses. Predictors of presenteeism amongst employed individuals reporting lifetime major depression with 12-month symptoms.

	Odds Ratio	95% CI	p
<i>Socio-Demographic/Financial Factors</i>			
Age			
15-34 years	1.00		
35-54 years	1.44	0.63-3.24	0.37
55+ years	1.98	0.76-5.16	0.15
Sex			
Male	1.00		
Female	0.73	0.31-1.74	0.48
Marital Status			
Not currently married	1.00		
Married	2.88	1.15-7.16	0.02
Education			
Non-school education	1.00		
No non-school education	1.39	0.69-2.80	0.34
Children			
None	1.00		
Any children	1.46	0.70-3.06	0.30
Housing Tenure			
Home owner	1.00		
Renting	0.42	0.21-0.86	0.02
Financial Difficulties			
No	1.00		
Yes	0.66	0.31-1.39	0.27
<i>Work Factors</i>			
Occupation			
Managers	1.00		
Professionals	0.49	0.14-1.72	0.26
Clerical/Admin Workers	1.49	0.34-6.44	0.58
Community, Personal/Sales	0.41	0.09-1.86	0.25
Technical/Trades	0.86	0.21-3.60	0.84
Operators/Drivers/Labourers	1.09	0.24-4.91	0.90
Work Hours			
35-40 hours	1.00		
1-34 hours	1.45	0.48-4.39	0.49
41 hours or more	2.37	0.87-6.47	0.09
<i>Health Factors</i>			
Treatment (12months)			
No treatment	1.00		
Treatment	0.59	0.29-1.17	0.13
Severity			
Mild/Moderate	1.00		
Severe/Very Severe	0.45	0.19-1.05	0.06
Recency			
No past month symptoms	1.00		
Past month symptoms	1.27	0.62-2.59	0.50
Antidepressant Medication			
No	1.00		
Yes	0.84	0.31-2.26	0.73

**Table 3-2 cont.**

Co-morbid Mental Conditions			
None	1.00		
Any	0.38	0.18-0.82	0.01
Co-morbid Physical Conditions			
None	1.00		
Any	1.09	0.89-1.35	0.37
Self-assessed Mental Health			
Excellent/Very/Good	1.00		
Fair/Poor	0.43	0.22-0.85	0.02
Self-assessed Physical Health			
Excellent/Very/Good	1.00		
Fair/Poor	0.58	0.25-1.35	0.20

For the first step, grouped socio-demographic and financial factors were entered into the model. Adjusted Wald statistics (Table 3-3) revealed the inclusion of age, sex, marital status and owning/renting status in the model creates a statistically significant improvement in its fit, compared to the null model [ $F(4, 56) = 2.27, p=0.07$ ].

Adding occupation factors to the model already containing socio-demographic/financial factors provided no significant improvement in model fit [ $F(6, 54) = 2.03, p=0.07$ ]. Health factors were entered into the model in the final step to create the full model. This resulted in the largest improvement in model fit [ $F(11, 49) = 2.58, p=0.04$ ] over and above socio-demographic/financial and work factors.

Adjusted Wald tests also assessed each *individual* factor's contribution to the predictive power of the model. The results shown in Table 3-3 revealed marital status [ $F(1, 59) = 3.13, p=0.08$ ], tenure [ $F(1, 59) = 2.69, p=0.10$ ] and co-morbid mental disorders [ $F(1, 56) = 2.10, p=0.15$ ] were the largest individual contributors.

**Table 3-3** Sequential logistic regression. Predictors of presenteeism amongst employed individuals reporting lifetime major depression with 12-month symptoms

Individuals Factors	F	df	Adjusted Wald statistic (p)	
<i>Socio-demographic, financial stress factors</i>				
Marital status	3.13	(1, 59)	0.08	
Owning/renting	2.69	(1, 59)	0.10	
Sex	0.72	(1, 59)	0.40	
Age	0.11	(1, 59)	0.74	
<i>Work Factors</i>				
Hours	2.82	(1, 59)	0.09	
Occupation type	0.34	(1, 59)	0.56	
<i>Health Factors</i>				
Comorbid mental disorders	2.10	(1, 59)	0.15	
Self-assessed mental health	1.37	(1, 59)	0.24	
Severity	1.06	(1, 59)	0.30	
Treatment	0.85	(1, 59)	0.35	
Self-assessed physical health	0.09	(1, 59)	0.76	
Grouped Factors	F	df	Adjusted Wald statistic (p)	Area Under the Curve (AUC)
1. Socio-demographic, financial stress factors	2.27	(4, 56)	0.07	62%
2. Work Factors	2.03	(6, 54)	0.07	63%
3. Health Factors	2.08	(11, 49)	0.04	67%

Each model's ability to discriminate between subjects who reported presenteeism, versus those who did not, was assessed using a series of cut points. 50% or fewer cases correctly classified suggests no discrimination, 70-80% is acceptable discrimination, 80-90% is considered excellent and 90% or greater is outstanding, although extremely unusual (35). Analysis revealed the model containing socio-demographic and financial factors alone correctly classified 62% of cases. This can be considered reasonable but below the "acceptable" cut-point of 70%. Adding work factors produced a small, 1% increase in successfully predicted cases (63%) over and above the already entered socio-demographic/financial factors. The addition of health factors, to create the full model, increased correctly classified cases to 67%.

### **3.5 Discussion**

This study aimed to determine factors associated with depression-specific presenteeism and the relative importance of socio-demographic, financial, work and health-related factors. Over and above the contribution of socio-demographic and financial factors, age, sex, marital status and housing tenure, work and health factors added little to the model's predictive ability. However, this is likely due to the order grouped variables were entered into the model, as a model containing health factors alone achieved reasonable classification of presenteeism cases. Factors identified as significant in the final multivariable model were marital status, housing tenure and co-morbid mental disorders.

Identifying the influence of socio-demographic, financial and health factors on work attendance behaviour informs a profile of employees reporting depression at greater risk of presenteeism. Specifically, being married, owning a home and reporting no co-morbid mental disorders were significantly associated with presenteeism behaviour amongst employed individuals reporting lifetime major depression with 12-month symptoms. However, the only factor potentially amenable to change via health professional or employer intervention is co-morbid mental disorders. Research is needed to determine how the influence of marital status and home ownership on work attendance behaviour could inform a protocol for intervention or the development of disease management guidelines for employers.

The association between co-morbid mental disorders and to a lesser degree self-assessed mental health and symptom severity, and work attendance behaviours is anticipated as they often indicate more disabling pathology. Symptom severity has a strong positive association with treatment (38), which is associated with increased work impairment (9) and decreased work participation (25). Similarly, co-morbidity of mental disorders is strongly associated with reduced work participation (39). These findings identify employed individuals reporting co-morbid mental disorders, poor self-assessed mental health and more severe symptoms were most likely to take a sickness absence. Employed individuals experiencing depression who continue to work are likely to be milder cases and those reporting depression-related sickness absence should be the more immediate focus of workplace mental health promotion strategies.

Such strategies may involve targeted mental health promotion. However, a recent meta-analysis revealed workplace health promotion interventions with an indirect focus on risk factors had similar beneficial effects on depression and anxiety symptoms as those with a direct mental health focus (40). Stress management programs designed to reduce hypertension (41) to interventions to increase physical activity (42), all appeared to be effective (40). Furthermore, employers may face challenges implementing depression-specific interventions as identifying depression-specific sickness absences and productivity decrements is complicated by employees' failure to disclose their illness. Even when disclosure occurs, providing appropriate support may prove difficult as modifying their duties exposes employees to the negative effects of stigma which may exacerbate their condition (43). Implementing workplace health promotion programs that do not specifically target depression may resolve these complications.

Sickness absenteeism predicts future sickness absences (44) and programs designed to prevent it may offer long term financial returns. However, individuals reporting presenteeism should not be overlooked regarding the development interventions to prevent or reduce negative consequences of depression. Research suggests low/moderate psychological distress, or sub-syndromal and minor depression, can significantly impair work ability (45) prompting employees to engage in compensatory behaviours such as working longer hours. Prolonged exposure to such high work demands may worsen their mental health (46), increase productivity loss and prompt long-term sickness absence (44), at significant economic cost.

Employees experiencing depression but continuing to work are prime candidates for improved disease management and intervention programs to facilitate sustainable work functioning and prevent depression-related productivity loss. Employers and health professionals could encourage, support and facilitate adequate treatment, shown to yield productivity gains in excess of direct costs (47). Additionally, efforts could be directed towards maintaining or improving at-work performance by targeting areas of work employees are experiencing difficulty with and rearranging job tasks to suit their abilities (9).

Employers and health professionals may further assist by offering flexible work attendance arrangements which accommodate graded sickness absence. This involves employees combining work and sickness absence i.e. working part-time, working full-time hours but performing modified tasks, or performing regular tasks with reduced input, whilst receiving a partial sickness benefit and partial salary (48). As employees reporting presenteeism tend to be the milder depression cases, their work capacity is reduced but not eliminated. Graded sickness absence would allow employees to exploit their remaining work-capacity whilst taking time off work when unable to make a productive contribution. Graded sickness absence has proven effective in keeping people with reduced work ability in work-life (48-50) which may have positive effects on health and well-being through the maintenance of their daily routine and social support from co-workers. Employers also benefit as employees prescribed graded sickness absence have shorter absence periods (50) and faster returns to full time work (48).

Marital status was the socio-demographic factor most strongly associated with presenteeism in our sample. This association is consistent with findings in epidemiology, clinical, and health psychology literature that married people experience relatively good mental health (51-56). Although the relationship between marriage and mental health may reflect selection effects, as more resilient, psychologically healthy individuals pursue marriage and stay married (36, 56), most researchers use the marital resource model to explain the association. This posits marriage provides social, psychological and economic resources which promote physical and mental health (54). Romantic relationships exert a protective role on symptoms of depression and buffer the effect of psychopathology. This emotional resilience may reflect access to coping resources provided by marriage, such as social support, which facilitates the continued functioning and work ability of married individuals who develop depression.

Although all employed individuals in our sample reported experiencing depression symptoms, marital status may have a similar protective effect in reducing the impact of the disorder on work ability. Individuals in a romantic relationship are less likely to report psychomotor retardation, feelings of overwork and irritability than un-partnered equivalents (57), all of which contribute to reduced functioning at work. Indicators of marital function and quality, such as equality of decision making and

perceived ability to confide in or rely on a spouse, are important contributors to physical and mental health (58) and by extension prompt presenteeism.

Alternatively, employees' beliefs about their spouse's reliance on them encourage presenteeism. Longitudinal prospective research exploring potential social cognitive influences on presenteeism may address these questions.

This information may help employers manage depression, and related sickness absence and productivity loss, by identifying which employees may be in need of greater support at work. Unmarried individuals were more likely to take time off work meaning they may not be receiving any form of support. This could worsen symptoms and prompt long-term sickness absence. It is in employers' interests to ensure their employees without spouses receive adequate onsite support, by identifying co-workers willing to provide on the job support, developing peer support networks, or promoting the use of employee assistance programs (EAPs) (59), as such measures increase job control, improve job performance, and reduce depressive symptoms (60).

Further investigation of the association between home ownership and presenteeism is warranted. Homeownership, as compared to renting, was significantly associated with continued work attendance in our sample. Recent research has suggested financial pressures may influence work attendance. Specifically, employees experiencing financial hardship are more likely to continue working, particularly those in casual jobs or with limited access to paid sick leave (23). Our findings do not support this hypothesis. Renters in this sample who had a lower mean income and increased likelihood of financial distress (2) were more likely to report sickness absence. Furthermore, as home owners are more likely to have a history of fiscal responsibility and financial security to be in a position to own a home, their decision to continue working when sick is unlikely to be prompted by financial pressure. Although, it could be that compared to renters, home owners feel they have more at stake and thus feel more threatened by financial instability. Exploration of social cognitive variables may be enlightening as subjective cognitive appraisals predict emotional and behavioural responses to challenging situations. Future research should explore employees' cognitive appraisals of the perceived threats and consequences of non-attendance at work, as well as their attitudes towards non-attendance more broadly.



### 3.5.1 Limitations

Work-related factors associated with work participation and functioning have been identified as an area in need of further investigation (25, 61). However, a focus on modifiable factors such as work demands, resources (e.g., social support, security), tasks performed and workplace culture (e.g., supervisory behaviour, leadership style, organisational justice) is recommended. This study was restricted to objectively measured factors; work hours and occupation type. The NSMHWB did not collect information on psychosocial work environment, despite its identification as a significant influence on work attendance of employees experiencing depression (62, 63). Additionally, the cross sectional design of the survey meant causal inferences cannot be made regarding the association between the reported factors and presenteeism behaviour in this population. Employees' transition over time from one status to another and the cross-sectional design precludes examination of processes associated with changes in work behaviours.

Further, the NSMHWB's definition of workforce participation is limited to those reporting full or part time employment. There is further scope to explore potential predictors of depression-related absenteeism and presenteeism in casual or voluntary labour forces, and inclusion of such factors may increase the model's ability to predict presenteeism behaviour at a statistically acceptable level (35).

### 3.5.2 Strengths

The strength of this study lies in the exploration of the relative influence of selected socio-demographic, financial, work and health factors on work attendance behaviours amongst employed individuals experiencing lifetime major depression with 12-month symptoms. To our knowledge no other study has addressed this. To do so using a large, epidemiological sample such as the NSMHWB represents an important contribution to the literature.

### **3.6 Conclusions**

The documented health and economic burden of depression-related absenteeism and presenteeism (6, 10, 64), provides evidence for a business case for employers to actively manage the disease and the associated work attendance behaviours amongst their employees (65, 66). However, employers remain relatively unresponsive to the need for workplace-based programs designed to manage depression and depression-related absenteeism and presenteeism (67). Employers' reluctance to engage in such programs could arise from a lack of information relating to what prompts employees to continue working when ill or take a sickness absence. Additionally, despite the impact it has on workplace functioning and productivity. Employers may feel a sense of uncertainty regarding their role in managing depression, considering it the responsibility of the individual and their treating physician. These beliefs may be reinforced by existing research which has focused on disorder-related determinants of work participation or work functioning among depressed employees, at the expense of the modifiable personal or work-related factors (25), which employers may feel are more within their control.

This study informed a profile of employees at greater risk for presenteeism; those who were married, owned a home, or reported no co-morbid mental disorders. Fewer co-morbid mental disorders amongst presenteeism reporters suggest individuals experiencing depression who continue to work are likely to be milder cases. These employees may be ideal candidates for graded sickness absence programs which use their remaining work ability whilst allowing time off for treatment and recovery. Employers attempting to prevent or reduce negative consequences of depression could focus on this approach. However, the study findings did not indicate why marriage or home ownership encouraged continued work attendance. These indicators therefore cannot, as yet, be used by employers to establish a more effective protocol for managing depression-related work attendance. Longitudinal prospective studies to explore the influence of social cognitive variables, such as attitudes and subjective norms (68), and marital functioning and quality on employee work attendance behaviour may elucidate the relationship between marital status, home ownership and presenteeism. This may identify aspects of these factors amenable to change through intervention, and lead to improved depression management, work

attendance behaviour and related health and economic outcomes, and ultimately maintain and even improve productivity within this population.

### **3.7 Postscript**

In this chapter, I have reported that classification of presenteeism cases based on age, sex, and marital status was reasonable and that work factors (work hours and occupation type) and health factors (treatment, self-rated health, co-morbid mental disorders) factors improved the models predictive capabilities minimally. Our final multivariable model revealed marital status, housing tenure and co-morbid mental disorders were important correlates of presenteeism behaviour.

Using available factors, our model's ability to discriminate between absenteeism and presenteeism outcomes did reach a statistically acceptable level i.e. 70% or more of presenteeism cases successfully classified. This highlighted the contribution of unmeasured factors to presenteeism behaviour. Therefore, we suggest that future research explore the relative importance of psychosocial work environment and personality factors such as work demands, job satisfaction and job tension and conscientiousness. Further, while these findings are generalizable to the Australian working population the study did not measure any occupation or industry specific factors. Therefore, we recommend that future research focus on occupations or work settings in which depression and related-presenteeism may be particularly prevalent and strategies designed to manage these behaviours, and minimize the associated health impairments, job turnover and lost productive time may be underdeveloped, such as small to medium enterprises (SMEs).

This suggestion prompted a systematic review of all relevant published and unpublished stress, burnout and workplace mental health literature to determine: a) prevalence of depression in SMEs; b) predictors and consequences of depression in this setting, particularly depression-related absenteeism/presenteeism; and c) costs/health outcomes of depression-related absenteeism/presenteeism. The results of this systematic review are presented in Chapter 4.

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## **Chapter 4. The antecedents and consequences of depression in small-to-medium enterprise owner managers A systematic literature review and future research agenda.**

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### **4.1 Preface**

Small-to-medium enterprises (SMEs) may experience the antecedents and consequences of depression more acutely than larger organisations due to certain working conditions. Managing depression-related sickness absenteeism and presenteeism and associated productivity loss may be more challenging as SME's size and structure make administration, finance, and HR responsibilities difficult. This may diminish SME's growth and long-term sustainability. Therefore this chapter reports the findings of a systematic review which reviewed stress, burnout and workplace mental health literature addressing: a) prevalence of depression in SMEs; b) predictors and consequences of depression in this setting, particularly depression-related absenteeism/presenteeism; and c) costs/health outcomes of depression-related absenteeism/presenteeism. Greater awareness of what prompts depression-related work attendance decisions in SMEs, may improve the management of these behaviours, and minimize health impairments, job turnover and lost productive time.

The text that follows is included in a manuscript that has been submitted for review by the International Journal of Health Promotion.

### **4.2 Introduction**

Depression is a common global mental health condition and the world's leading cause of non-fatal disease burden (1). Lifetime prevalence of major depressive disorders is estimated at 16.2% amongst US adults (2) and 15% in Australia (3). Depression is also common within the working population (3, 4), affecting employees and managers at all levels of an enterprise structure (5). Therefore, a large proportion of the social and economic consequences of depression are borne by the

business community. One sector which may experience depression and the related health and economic consequences more acutely is small-to-medium enterprises. This paper will propose a theory based on a systematic review of existing stress, burnout and depression literature conducted in larger organisations and knowledge of SME structure and business characteristics, as to why this may be the case and develop a model to guide future research designed to test these assumptions.

#### **4.2.1 Definition of small-to-medium enterprises and SME owner/managers**

Although international variation surrounds what constitutes a medium-sized firm, the OECD definition, which includes businesses employing up to 250 people (6), was used in this paper. The primary focus of this review was SME owner/managers. However, the self-employed, sole traders, and entrepreneurs were included in the scope of the research as they are likely to experience many of the same work-related stressors which precede depression such as work overload, financial pressure and role conflict.

### **4.3 Antecedents of stress and depression in small to medium enterprises (SMEs)**

#### **4.3.1 Responsibility to employees, family and self**

Within SMEs, decision authority is typically concentrated at the owner/manager level and an owner/manager's personality, skills, attitudes and behaviours can influence the direction, growth and success of the business. Therefore, the financial security of their employees, their employees' families, and that of their own family can depend on their ability to make suitable business decisions (20). Such responsibility could potentially increase the stress SME owner/managers experience, which may in turn be exacerbated by the feelings of loneliness and isolation it fosters

(21). Owner/managers often report feeling unable to discuss critical day-to-day decisions within their business, or those relating to long-term strategy and planning, on a peer-to-peer basis with employees or feel it is inappropriate to do so (22). At worst, indication of business problems may be down played by owner/managers which can further contribute to their sense of loneliness (21, 23) and amplify feelings of stress and depression.

#### **4.3.2 Emotional Contagion**

SME owner/managers experiencing poor mental health may also jeopardize the mental health of their employees due to the “emotional contagion” phenomenon. Emotional contagion refers to the way in which a person or group can influence the emotions and/or behaviour of another person or group (24). This effect is particularly salient in relation to everyday moods in work groups (25, 26), and within the “leader/follower” relationship which exists between owner/managers and their supervised employees (27). It may be more prominent within SMEs as their size and organisational structure, in which small work teams and regular, daily contact with owner/managers are standard, increase employees’ proximity to their managers’ emotions. Therefore, SME owner/managers experiencing symptoms of stress or depression may be more likely to prompt similar symptoms amongst their staff than managers in larger organisations (28).

#### **4.4 Moderators of Stress, Burnout and Depression**

Several studies have posited stress is an adjunct to entrepreneurship and an unavoidable part of owning and/or managing a small business (29, 30). However, coping skills play an important role in determining how an individual perceives and reacts to stress or stress-inducing situations. Research has shown individuals can respond differently to the same situation due to differences in their coping behaviour; the actions engaged to avoid being psychologically harmed by a problematic experience (31-34). Various personality and work-related factors improve an individual’s ability to cope, and thus may act as buffers against the deleterious effects of stress and, by extension, burnout and depression (32, 35, 36). For example, job stress is an individual’s reaction to work environment characteristics or situations

which appear emotionally or physically threatening, and an individual's past experiences, their inherent personality characteristics, and the social and organisational resources available to them all have the potential to influence their reactions to those circumstances.

This concept may be particularly relevant in the SME sector as it has been proposed entrepreneurs and small business owner/managers have attitudes, values and personality characteristics distinct from other professionals (36). Several studies have posited work-related factors such as greater control over work, more decision authority, and positive psychological resources, may prompt entrepreneurs and SME owner/managers to perceive lower levels of job stress (37-39). These factors may guard against the negative consequences of working in a high pressure environment. The effects of job stress, burnout and depression could be moderated by higher job control, and characteristics such as high self-efficacy (a facet of psychological capital) and an internal locus of control, which are aspects of the "entrepreneurial personality" that thrive in highly demanding situations. Although not the main focus of this review, or our proposed model, we will examine these potential moderators.

#### **4.4.1 Active Job Hypothesis: High Demands and High Control**

According to Karasek's "demand-control" model, jobs with high psychological demands, limited decision-making authority regarding when and how individuals complete their work, and few opportunities to develop and use their skills, are classified as "high strain" jobs. "Job strain" may elevate a worker's chances of experiencing poor physical and mental health as high-strain jobs have been shown to be associated with physical illness, fatigue, anxiety, burnout and depression (8-10). Recent estimates revealed job strain approximately doubles a worker's future risk of depression (10, 11). The combination of high demands, limited resources and low control, which typifies "job strain", may lead to the development of depression via job burnout. Burnout is a psychological phenomenon characterized by emotional exhaustion, depersonalization, and feelings of reduced personal accomplishment (12, 13). Prolonged experience of low resources and high demands leads to a loss of other resources such as of energy and perceived efficacy (14, 13); this is the burnout process. Specifically, prolonged exposure to job strain prompts emotional exhaustion, in which workers feel they cannot give any more emotionally to the job.

Depersonalization or cynicism may follow, as individuals attempt to distance themselves from the job as a maladaptive way of coping with excessive demands and limited resources, which in turn may lead to a reduced sense of personal accomplishment, or a decrease in the workers perceived professional efficacy (12).

Burnout is an affective reaction to ongoing stress, such as job strain which is the gradual depletion over time of an individual's basic energy resources, resulting in emotional exhaustion, physical fatigue and cognitive weariness (16). Recent research has established job strain is more strongly related to burnout than depressive symptoms or disorders (17, 18), and burnout may in fact mediate the association between job strain and depression. That is, there exists a reciprocal relationship between burnout and depressive symptoms and job strain predisposes to depression through burnout (19). Therefore occupational burnout can be seen as an intermediary stage in the development of workplace depression, as we have represented in our model (Figure 4-1).

SME owner/managers may experience high job demands, such as multiple role responsibilities and long working hours. As mentioned, when combined with low control, high demands create 'high strain jobs' which carry an increased risk of stress, burnout and depression (17). However, high demands are unlikely to lead to psychological strain when an individual has sufficient control over their work and the freedom to use their available skills; both of which are possible for a SME owner/manager. According to Karasek's "Demand-Control Model" these jobs are called "active jobs" (7). Active jobs are likely to positively challenge incumbents, leading to learning, the development of active coping patterns, and increased feelings of mastery (19, 40). Active jobs may prevent perceptions of strain as individuals feel equipped to effectively cope with them (19, 41, 42), and subsequently reduce the risk of job stress, burnout and depression.

A recent study used the allostatic load model (43) to explore how high job control and active jobs reduce entrepreneurs' likelihood of experiencing stress-related somatic diseases and poor mental health outcomes (38). Allostatic load is the cumulative strain placed on several organs and tissues which occurs following prolonged exposure to unhealthy behavioural (smoking) and physiological (increased heart rate) responses caused by evaluating situations as threatening. For example,

allostatic load can occur when an individual is exposed to chronically unfavorable job characteristics (43). This strain may predispose individuals to stress-related somatic diseases such as hypertension or heart disease and increases in stress hormone may prompt structural changes in the central nervous system which enable the development of mental disorders. However, Stephan & Roesler (2010) (38) proposed, unlike “high-strain jobs” in which the incumbents perceive the working situation as threatening due to their lack of control, entrepreneurs and SME owner/managers in “active jobs” experience ‘activating stress’ in which high demands challenge the individual to engage in active problem solving, but do not lead them to appraise the situation as a threat. This situation is known as an “active coping stressor situation”.

In active coping situations individuals have been shown to report enjoyment of their work, lower levels of stress and exhibit physiological reactions consistent with “short-term energy mobilization” (38). For example, a positive reaction may manifest when an individual is confronted by a demanding situation they feel they can manage, which may in turn give them the energy to commit enthusiastically. This short term energy mobilization then leads to action, thus decreasing allostatic load, and diminishing the chances of experiencing prolonged stress and more serious physical and mental health complications such as depression.

#### 4.4.2 Entrepreneurial Personality

In addition to organisational or work factors, certain personality characteristics have been shown to influence how an individual copes with a stressful situation and research has been dedicated to exploring the idea of an “entrepreneurial personality” (44). While contention remains within entrepreneurship research as to whether such a type exists, some traits have been identified as more common within this occupational group. Further, entrepreneurs and small business owners have been shown to differ from other professionals in terms of their attitudes, values, and certain demographic characteristics (45). These differences in personality may influence their perceptions and experience of workplace stressors (35, 45, 46), protecting SME entrepreneurs and owner/managers from the negative consequences of long term exposure to stress; burnout and depression.

To date research has identified that entrepreneurs, compared to managers and other professional groups, exhibit a higher autonomy, perseverance, readiness for change, persuasiveness, and lower emotionalism, need for support, and conformity. Traits such as need for achievement, generalized self-efficacy and, importantly, stress tolerance have also been shown to be associated with the entrepreneurial behaviour (36). Finally, entrepreneurs and SME owner/managers are more likely to display an internal locus of control and thus believe the events in their lives are as a result of their behaviour and actions (35, 36, 47-49).

## **4.5 Consequences of Depression in Small-to-Medium Enterprises**

Various, aforementioned SME features have the potential to produce a high stress working environment. Combined with the infrequent development and adoption of programs to support and educate owner/managers and employees experiencing poor mental health in SMEs (50-52), these characteristics may produce negative health and economic consequences. Across workplaces in general direct impacts include increased risk of stress, emotional burnout, and depression. Indirect outcomes include large economic costs attributable to job turnover and reduced job retention (53, 54), increased risk of workplace accidents or injuries (56), a greater number of health services accessed, and most notably, work impairment, disability, absence (56, 60), and reduced productivity (58). Depression may ultimately lead to business failure as decreased creativity and negative business behaviour alter business orientation and jeopardize its continued success (59). Each of these potential outcomes is discussed in the context of SMEs.

### **4.5.1 Depression-related absenteeism and presenteeism: Cost and health outcomes**

Job turnover and associated hiring and training costs (54), increased workplace accidents or injuries (55), and health service use all contribute to the cost of workplace depression. However, the most significant contributors are the indirect costs, related to work impairment, disability (57) and lost productivity arising from sickness absence and individuals who work when ill (presenteeism) (58).



Absenteeism, presenteeism and related lost productive time are substantial contributors to the high economic burden of depression and approximately 80% of depression-related productivity loss can be ascribed to presenteeism alone (58). Worldwide, this equates to annual costs of 18.2 billion USD (58), 15.1 billion UK pounds (60) and \$12.6 billion Australian dollars (53). In addition to reduced productivity, recent research has identified long-term health consequences of continued work attendance when sick. Specifically, sickness presenteeism is associated with a 50% increase in incidence of serious coronary events compared to unhealthy employees with moderate levels of sickness absenteeism (61).

Depression-related presenteeism costs and long-term health consequences related to continued work attendance are likely to be felt keenly in SMEs as magnified work attendance pressures motivate SME owner/managers and employees to continue working more than they would in larger organisations. Within the large body of research investigating the antecedents of absenteeism, several studies have identified organisation or firm size is positively correlated with absenteeism (26, 62-71). Consequently, the prevalence of presenteeism may be much higher in SMEs as absenteeism behaviour is less likely as a response to reduced coping with work-related stress.

Notable explanations include de Kok and colleagues (2005) who posited that a greater sense of responsibility towards co-workers prompts fewer absences in smaller firms (65). Others attribute lower absenteeism rates to multiple role responsibilities which render workers unable to compensate for the productivity of sick or absent colleagues (72). Alternatively, a strong connection to the wellbeing of the company (64), promoted by the lack of anonymity experienced within SME work teams, fosters a “family” environment which may reduce the extent to which sickness absence is taken in SMEs. Moreover, the symbiotic relationship between individual and organisational performance, compared to larger organisations, may also discourage sickness absence (65, 73, 74). Finally, SME owner/managers, particularly sole-traders, are likely to experience pressure to attend work when ill as their livelihood, and that of their family, is contingent on the continued viability and productivity of their business.

Some studies adopt an economic perspective to explain the relationship between firm size and sickness absenteeism. Coles and Treble (1996) suggest productivity losses due to absenteeism are lower in larger organisations as they can insure against absence at a lower cost (75). As a consequence, absenteeism is expected to be higher in larger firms as they have back up human capital to compensate for absent workers (75). For larger firms, team production, where workers are required to function as part of a team, acts as an insurance device by increasing the likelihood there will be a minimum number of employees present to complete the work. Barmby and Stephan (2000) support this position and add that workers who can fill in for their sick or absent colleague are more likely to be equally skilled or trained in larger firms (62).

According to Aronsson's (2005) (76) theoretical model for research into sickness presenteeism, sickness absenteeism and presenteeism are alternatives of the same decision process and to understand work attendance behaviour, consideration of the predictors and consequences of both outcomes is necessary. Aronsson's model is useful when exploring depression-related absenteeism and presenteeism behaviour within the SME sector as the predictors and consequences may be more inextricably linked than in larger organisations. That is, organisational characteristics unique to SMEs may prompt continued work attendance which may increase the associated productivity loss. For example, high presenteeism rates may arise as small teams rely on interdependent worker productivity which prompts employees to continue working when unwell (68, 77). Smaller teams may also mean co-workers or managers are unable to compensate for the reduced work capacity of employees who continue to work whilst ill, thus increasing the cost.

As well as threatening the success of individual small businesses, depression-related presenteeism, and its potentially significant health and economic consequences, have global economic effects due to the contribution SMEs make to most developed economies worldwide. SMEs account for 99.9% of all businesses in the UK (78) and 99.2% of all businesses in Australia (3). Figures are similar in the US where the nation's 6 million SMEs represent 50.2% of its private-sector employment (79). SMEs are responsible for a large proportion of new jobs growth and their smaller size allows them greater flexibility to accommodate market demands or respond to competitive dynamics, thus making them integral to continued global economic growth. With the estimated impact of depression-related productivity loss reaching

billions of dollars, and SMEs representing the most common form of business and a majority employer in most developed economies (80), improved management of the work-related precipitants of depression, related work attendance behavior, and the associated cost and health outcomes in this setting is vital.

#### 4.5.1 Reduced innovation and creativity

In addition to the economic costs, depression has the potential to adversely influence owner/managers' positive business behaviours as the associated negative affect may reduce their capacity to think creatively and innovatively (81, 82). Recent functional imaging studies of patients with depression showed reduced cerebral blood flow, and subsequent reduction in brain activity, in parts of the brain responsible for attention and the development of thoughts or plans about future activities (83). This is particularly important for SME owner/managers who must be able to develop risk management strategies which allow them to adapt quickly to sudden change in economic conditions, a process which requires creative forethought to imagine various different scenarios and develop the means to avoid them.

Barsade and colleagues (2007) (24) suggested positive affect influences creativity by producing a state in which more cognitive material, and therefore more "variety in the elements that are considered" by an individual, becomes available for processing. Depression may inhibit this process and pose an indirect threat to the success of SMEs as the associated cognitive deficits reduce the owner/managers imagination, their ability to think laterally and their capacity for creative thinking. Further, Heunks (1998) suggests individuals most adept at innovation and creativity are more likely to accept challenges, possess self-confidence and be flexible and open to risk taking behaviours, which are identified contributors to small business growth and success (82). These features are, at times, incompatible with the depression symptom profile which can be characterized by dysphoria, sadness, hopelessness, unhappiness and a lack of pleasure with the world and social relationships. However, it must be noted not all depressed people lack self-confidence, or are less likely to take risks, but when symptomatic they may be prone to a lack of these attributes due to their depressive symptoms.

## **4.6 Methods**

A systematic literature search identified all relevant research. A systematic review methodology was then used to assess the quality of said research, and interpret the findings.

### **4.6.1 Definition of small-to-medium enterprises, owner/managers and entrepreneurs**

Although the definition of a small-to-medium enterprise differs worldwide, the main criterion used in OECD countries is number of employees (84). General agreement exists between the US, UK, Australia and the EU regarding the definition of small firms; i.e. most are managed by their owners, who contribute most of the operating capital and are responsible for the principal decision-making of the firm. The OECD definition is used in this paper.

Also included in our review of SME literature are entrepreneurs, which is also variously defined. For example, Hebert and Link (in Acs, 2005) define an entrepreneur as ‘someone who specializes in taking responsibility for and making judgmental decisions which affect the location, form, and the use of goods, resources, or institutions’ (85). In a broader sense, and as it was used in prior studies, self-employment and business ownership are understood to be equivalent to entrepreneurship (86, 87). This occupational definition of entrepreneurship (i.e., entrepreneurs are people working for themselves) is adopted in the present research.

### **4.6.2 Definition of Depression**

An acceptable definition of depression was considered to be one employing recognized diagnostic criteria or a cut-off on a depression rating scale. Regarding the depression rating scales, they could be specific to depression symptoms (e.g. the Beck Depression Inventory (BDI) or the depression subscale of the Depression, Anxiety and Stress Subscale (DASS)), or a composite screening measure which provides a combined assessment of depression and anxiety symptoms such as the General Health Questionnaire (GHQ). Also included was depression as assessed by a

subscale of a general health measure which has evidence of validity as a depression or anxiety screening tool such as the SF-12 mental health summary scale (88).

#### 4.6.3 Selection of Articles

A search strategy was employed using database search engines in the relevant subject areas; Health/Medical (Medline, PubMed, MD Consult), Health Economics (Econlit), Management (Business Source Premier, Informit) and Psychology (PsycINFO, PsycArticles). Other database search engines used were ProQuest, CINAHL, Web of Science and Scopus. Books, reports, book chapters, conference proceedings and unpublished theses were also searched to reduce potential publication bias.

Key word searches were divided into three categories, with one term for each category being present in order to generate a database hit (Table 4-1). The first group of search terms related to mental health and included a long list terms reflective of a primary or secondary focus on depression. The next group included terms relating to the workplace and SMEs. Finally, search terms relating to evaluation of the consequences of workplace depression were entered including. The search was not limited to any time period or language. Article titles and abstracts were screened by one author (FC) to determine eligibility.

#### 4.6.4 Inclusion criteria

Inclusion criteria were deliberately broad. Specifically, any study investigating the prevalence of depression or common mental disorders in SMEs or the predictors and/or consequences of depression-related absenteeism and/or presenteeism specific to SMEs. Once the content of the studies matching these criteria was assessed a coding protocol developed by the first author (FC) was used to describe and differentiate included studies and extract and organize findings.

#### 4.6.5 Abstraction of data and data synthesis

Information intended for examination included authors, publication date, methods and method quality, program or intervention type (if relevant), participant, client or

sample characteristics, information regarding the outcomes such as measure or operationalization used, whether it was a composite or single item, reliability and validity such measures and the study findings, which were aggregated if necessary.

**Table 4-1** Key search terms used.

	Keywords for Mental Health/Depression (OR)	A N D	Keywords for SME (OR)	A N D	Keywords for Outcomes
Research Question One:	Mental, Mood, Psych*, Depress* Anxi*, CMD, Symptom*, Well* Wellbeing, Disease, Stress Sick*, Ill*, Health Prevalence, Rate		Manage*, SME, Small* Medium Enterprise*, Business*		Absence Absent* Presenteeism Attend*ance* Inefficiency
Research Question Two:	Mental Mood Psych* Depress* Anxi* CMD Symptom* Well* Wellbeing Disease Stress Sick* Ill* Health Prevalence Rate		Manage*, SME, Small* Medium Enterprise*, Business*		Absence Absent* Presenteeism Attend*ance* Inefficiency Psychosocial* Finance* Risk factor* Circumstances Personal Attitudes Predictor Influence Non-work Antecedents Demand Control Environ* Strain*
Research Question Three:	Mental Mood Psych* Depress* Anxi* CMD Symptom* Well* Wellbeing Disease Stress Sick* Ill* Health Prevalence Rate		Manage*, SME, Small* Medium Enterprise*, Business*		Absence Absent* Present* Presenteeism Attend*ance* Inefficiency Outcome Cost Econ* Inefficiency LPT* Lost productive* Turnover QALY Impact Loss Financ* Disability Function* Perform*

## **4.7 Results**

As the search strategy was deliberately very broad we generated 2131 hits in our first search, 3245 in our second search and 3956 in our third search. However, all the studies were excluded after reviewing the title and abstract as none were specific to the SME setting. Several studies which considered organisation or firm size as a predictor of employee absenteeism were identified. These studies are presented in Table 4-2 and discussed further in section 4.7.2 of this chapter.

### **4.7.1 Prevalence of depression in small-to-medium enterprises (SMEs)**

No studies reporting the prevalence of depression in small-to-medium enterprises (SMEs) were identified.

### **4.7.2 Predictors and/or consequences of depression with SMEs**

No studies exploring the predictors and/or consequences of depression within SMEs were identified. Further, no studies were identified which investigated the rate and causes of work attendance behaviour within SMEs, either depression-related or otherwise. However, within the large body of research investigating the antecedents of absenteeism, organisation or firm size has been identified as a significant predictor of employee absenteeism (62, 68, 89) (Table 4-2).

The majority of absenteeism research has been conducted from two distinct theoretical viewpoints, the psychological/sociological perspective and the economic perspective. Steers and Rhodes (1978) developed an influential, psychological model, based on a review of 104 empirical studies, which suggests employee absenteeism is determined by their motivation and their ability to attend (90). Ability is affected by illness and accidents, transport difficulties, and family responsibilities whilst motivation is influenced by satisfaction with job situation and several internal and external pressures, including firm or organisation size. In terms of what prompts fewer absences in smaller firms, explanations include a greater sense of responsibility towards co-workers (65), a strong connection to the wellbeing of the company (64), and a clear relationship between individual and organisational performance (73) (Table 4-2).

Small teams, in which workers often have multiple role responsibilities, are likely to increase an SME employees' motivation to attend work. Absence increases co-worker workload and as most SME employees value their co-worker relationships they may continue to attend work when ill to avoid damaging them (65). The clearer relationship between individual and organisational performance in SMEs may reduce employees' tolerance for absence and prompt their continued work attendance (65, 74). Further, the lack of anonymity experienced by SME employees, as a result of more direct contact with owners or managers, may generate a greater sense of responsibility and commitment than that experienced by workers in larger organisations. This organisational feature may increase employee's "attitudinal commitment", defined as taking pride in the organisation and internalizing of its goals and values, psychological absorption in their role to benefit the organisation and loyalty or attachment to the organisation which manifests as sense of belonging. The subsequent "family" environment which is often fostered within SMEs may increase presenteeism rates as a sense of obligation to the business motivates employees to continue to work when sick (91).

One study specifically looked at absenteeism due to depressive symptoms and found periods of absence were longer in smaller companies and reintegration percent, or the number of workers who returned to work following absence, was lower in small companies with less than 75 employees (69). These findings were attributed to fewer opportunities for part time return to work and a lack of structure protocols to inform management of long-term sickness absence.

Studies which adopted the economic perspective to explain these effects were also identified (Table 4-2). Coles and Treble (1996) (75) developed a model which posits that potential productivity losses due to absenteeism are lower in larger organisation as they can insure against absence at a lower cost. As a consequence absenteeism is expected to be higher as they have back up human capital to compensate for absent workers. More specifically, for larger firms, team production acts as an insurance device by increasing the likelihood there will be a minimum number of employees present to complete the work. Barmby and Stephan (2000) (62) supported this position and added larger firms can further diversify their risk of worker absence by operating multiple lines.



#### 4.7.3 Predictors of depression-related work attendance in SMEs

No studies investigating sickness presenteeism or the specific predictors and/or consequences of depression-related absenteeism and/or presenteeism in SMEs were identified. A coding protocol was developed but the lack of relevant studies rendered it unnecessary.

Table 4-2 Studies focused on absenteeism in small-to-medium enterprises.

Author/Year	Country	Title	Journal	Main Interest
Coles & Treble (1996)	UK	Calculating the price of worker reliability	Labour Economics	Rate and costs of absenteeism by firm size and industry.
Bacon et al (1996)	UK	It's a small world: Managing human resources in small business	International Journal of Human Resource Management	People management in small business: including work attendance management.
Barmby & Stephan (2000)	UK	Worker absenteeism: Why firm size may matter	The Manchester School	The relationship between absence and firm size.
Boon (2000)	The Netherlands	Determinants of days lost from work because of illness: A micro analysis of firm-level data	Netherlands Official Statistics	The impact of a number of company variables, such as sector of economic activity, labour productivity, capital intensity and market share, on sick leave in the Dutch private sector.
Vistnes (2000)	US	Gender differences in days lost from work due to illness	Industrial and Labor Relations Review	Investigate the extent and determinants of gender differences in days lost from work due to illness.
Benavides et al (2000)	EU	How do types of employment relate to health indicators? Findings from the Second European Survey on Working Conditions	Journal of Epidemiology and Community Health	To investigate the associations of various types of employment with six self-reported health indicators. Main outcomes were three self-reported health related outcomes (job satisfaction, health related absenteeism, and stress) and three self-reported health problems (overall fatigue, backache, and muscular pains).
De Kok (2005)	The Netherlands	Precautionary actions within small and medium-sized enterprises	Journal of Small Business Management	Decision-making in whether to take precautionary action to manage absenteeism in SMEs.

## **4.8 Discussion**

### **4.8.1 Implications and Direction for Future Research**

This paper aimed to review literature exploring the antecedents, and outcomes of depression within SMEs. In doing so it aimed to establish whether antecedents might be experienced differently within this setting, and whether the consequences of depression are felt more acutely due to the unique organisational structure and work characteristics of SMEs. For example, long working hours leading to poor work/life balance, burnout and overload, and multiple or ill-defined work roles which prompt role conflict, are known precipitants of job stress and depression, and may be more prevalent within SMEs due to their organisation and size (36, 92, 93). Having fewer employees may also augment the health and economic consequences of depression, as small teams cannot compensate for absent co-workers, which may decrease tolerance for sickness absence, and increase presenteeism and associated lost productive time.

This shortage of SME-specific evidence leaves occupational health literature and small business researchers and policy makers without an understanding of the relative impact of work related factors in the development of depression within themselves and their employees, or what prompts depression-related work attendance decisions. Therefore, SME owner/managers are unable to determine whether these influences are within their control or amenable to change. Such unawareness may make SME owner/managers hesitant to provide assistance to employees experiencing depression, unsure as to how to manage their work attendance, and reluctant to implement workplace mental health promotion and intervention strategies. Further, a lack of understanding may render SME owner/managers unable to recognize the signs and symptoms of depression within themselves, which may compromise their ability to provide social support and create a positive work environment (94) and, as a result of the emotional contagion phenomenon, compromise the mental health of the employees and the success and productivity of their business.

The scant information available on the occupational health of SME owner/managers and their employees is adapted from large, population based surveys constructed for purposes other than exploring the associations between work, health and wellbeing in this setting. Further, the majority of workplace health promotion programs are developed and piloted in larger organisations and do not suit the specific needs and organisational structure of a smaller business. This means SME owner/managers are without evidence, specific to their sector, regarding the value of workplace mental health promotion as the evaluation of the economic impact of depression, related absenteeism and presenteeism, and the potential health and economic benefits conferred by mental health promotion is infrequent in SMEs (95).

Additionally, large nationally representative surveys will coincidentally include depression prevalence estimates from SME employees, but without specific identification it is not possible to separate them from individuals employed in larger organisations. Using existing, nationally representative data to determine the lifetime prevalence of depression amongst employed Australian population (9.4%) (96) and the proportion of the working population employed in SMEs (3.3 million, 30%) (3), it's possible to approximate the prevalence of depression in SMEs at approximately 2.8%. However, specific SME data is needed to confirm this estimate.

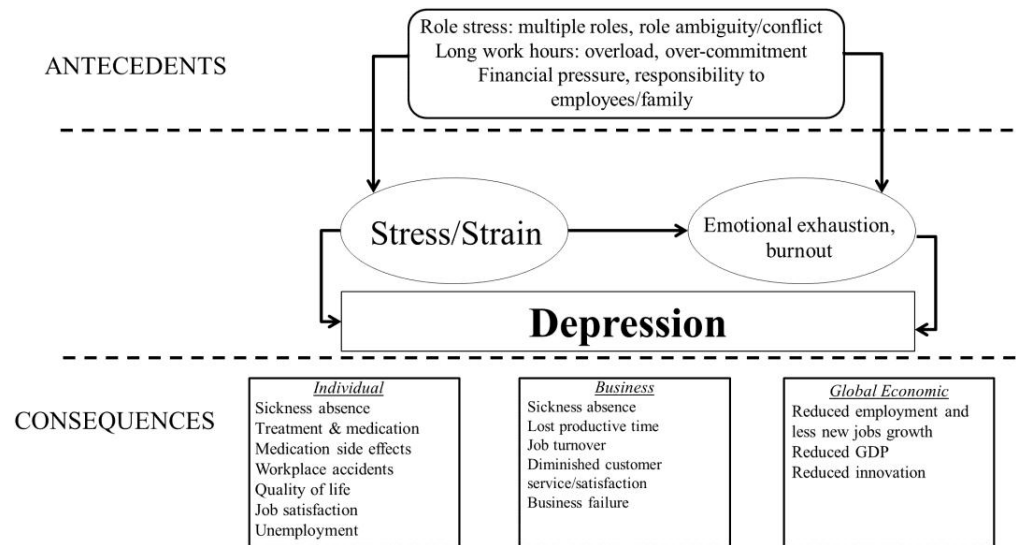
SME owner/managers are often preoccupied with the daily activities of the business, leaving them little time for lengthy consultation with employees and implementation of training and skills programs (97); a hurdle programs developed in larger organisations, with the capacity to employ human resource specialists or workplace health champions, may neglect to consider. They are also more likely to be motivated by “company-success” related factors than “humanitarian” factors (98) or “moral responsibility” factors when implementing workplace health promotion programs. Therefore, an easily applicable, relevant business case is needed to support the causal relationship between workplace health promotion, training and business success in the SME sector. The lack of a strong business case means owner/managers may remain unconvinced such strategies are worth their time or money (99). The lack of evidence of this nature may go some way to explaining why strategies employed by larger organisations, such as mental health literacy workshops or stress management training, are difficult to implement and are infrequently adopted by SMEs (51, 95).

While no studies have examined the prevalence or management of depression within SMEs, analysis of literature identifying the potential antecedents and consequences of depression within the broader workplace setting has allowed us to develop a model of how such predictors and outcomes may be experienced with the small business sector. Further, in response to this dearth of information a research agenda has been proposed to answer the following questions: What is the prevalence rate for depression in SMEs?; What are the rates of depression-related absenteeism and presenteeism in SMEs and how do they compare to those reported in larger organisations?; What factors correlate with absenteeism and/or presenteeism in SME, do they differ for managers and employees, and from those identified in larger organisations?; What are the costs and/or health outcomes of depression-related absenteeism compared to presenteeism in SMEs and how do they compare to larger organisations?

Identifying the prevalence of depression in the SME sector is necessary to answer these questions. Ideally prevalence would be determined using a representative sample of SMEs and a validated diagnostic instrument. Information pertaining to depression-related absenteeism, presenteeism and associated health and productivity outcomes and measures of various SME-specific organisational and individual factors are also required. One study which aims to collect this SME-specific information during its baseline phase is the workplace mental health promotion program, Business in Mind. The Business in Mind program aims to improve the mental health of SME owner/managers through the provision of a free DVD and resource kit designed to help managers recognize the signs and symptoms of depression and poor mental health in themselves and their employees. The study protocol for this trial has been published (52) and data collection is currently underway.

Answers to the proposed research questions would provide SMEs owner/managers with relevant evidence which could be used to improve the management of depression amongst their employees through the informed development of practice guidelines. Accurate information on the prevalence of depression in the SME sector may make owner/managers more conscious of the commonality of the disorder and thus more perceptive to depressive symptoms amongst their staff and themselves. Further, identification of the costs and health consequences associated with

depression, specifically the absenteeism- and presenteeism-related lost productive time, may increase SME managers' willingness to reduce the risks of job stress and depression within their business. Finally, identification of factors specific to the SME sector which increase the chance of job stress and depression may make it easier for owner/managers to identify which of these are within their power to change and encourage them to more proactively eliminate potential contributor to poor mental health outcomes.



**Figure 4-1.** Potential predictors, correlates and health and economic consequences of depression and related work attendance behaviour in small-to-medium enterprises.

## 4.9 Conclusions

Information provided by research targeted to these proposed research questions will improve understanding of what prompts depression-related work attendance decisions amongst SME owner/managers and their employees and improve the management of these behaviours, potentially minimizing health impairments, and job turnover and lost productive time. Providing evidence of the economic impact of depression in the workplace may also encourage SME owner/managers to adopt workplace mental health promotion programs and interventions designed to facilitate sustainable working lives for employees experiencing depression and for themselves as well as reduce the cost of depression to their business. Information could also be used to inform entrepreneurship education and training to improve SME

owner/managers' ability to recognize and manage stress and symptoms of poor mental health amongst themselves and encourage them to engage in help-seeking behaviour to avoid costly outcomes and potential business failure. Such outcomes will produce benefits for employees, owner/managers and their business as well as broader society though economies strengthened by improvements in the health and productivity of the SME workforce.

#### **4.10 Postscript**

In this chapter, we reviewed stress, burnout and workplace mental health literature addressing: a) prevalence of depression in SMEs; b) predictors and consequences of depression in this setting, particularly depression-related absenteeism/presenteeism; and c) costs/health outcomes of depression-related absenteeism/presenteeism. However, no studies were found.

In response to this dearth of information a research agenda has been proposed with a specific focus on the following questions: a) what is the prevalence rate for depression in SMEs?; b) what are the rates of depression-related absenteeism and presenteeism in SMEs and how do they compare to those reported in larger organisations?; c) what factors correlate with absenteeism and/or presenteeism in SME, do they differ for managers and employees, and from those identified in larger organisations?; d) what are the costs and/or health outcomes of depression-related absenteeism vs. presenteeism in SMEs and how do they compare to larger organisations?

In the next chapter, we will attempt to answer these questions using data from the baseline phase of a workplace mental health promotion program designed to improve the mental health of SME owner/managers, Business in Mind. It must be noted that, although a suggestion is made in this chapter, based on existing theory and literature, that SME owner/managers are susceptible to many of the established predictors of depression and poor mental health, the ensuing chapter (Chapter 5) will not attempt to identify the correlates of depression within a sample of SME owner/managers. Rather it will focus on the correlates of absenteeism and presenteeism amongst SME owner/managers experiencing high and very high psychological distress, in order to

align it with two of the three general aims of this thesis: i) identify the correlates of presenteeism amongst employed individuals reporting depression and psychological distress; ii) estimate the health and economic consequences of this behaviour.

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## **Chapter 5. Psychological distress and work attendance behaviour amongst small-to-medium enterprise owner/managers.**

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### **5.1 Preface**

In the previous chapter we conducted a review of the existing literature and developed a model to explain how small-to-medium enterprise owner/managers (SMEs) may experience depression and the associated health and economic consequences more acutely, and proposed several research questions.

This chapter addressed those research questions by aiming to identify: i) the proportion of SME owner/managers in our sample with high/very high psychological distress; ii) the proportion of past-month sickness absenteeism, presenteeism and inefficiency days within our sample of SME owner/managers reporting high/very high psychological distress; iii) the associated, self-reported lost productivity, and iv) which work, non-work and SME-specific factors were associated with these work attendance behaviours. It must be noted that unlike the study reported in preceding Chapter 3, which explored the correlates of presenteeism amongst a sample of employed individuals who had received a diagnosis of 12-month depression using the World Health Organization's Composite International Diagnostic Interview, version 3.0 (WMH-CIDI 3.0), this study used a sample of SME owner/managers reporting high or very high psychological distress as measured by the Kessler 10 Psychological Scale. This measure was used to estimate mental health because it was designed specifically as a measure of distress, and offered the advantage of easy administration in a notoriously time poor population. Further, high to very high levels of psychological distress have been shown to be associated with clinical diagnoses of anxiety and affective disorders (1, 2) and research has also revealed a strong association between high scores on the K10 and a current CIDI (Composite International Diagnostic Interview) diagnosis of anxiety and affective disorders (1).

Such work is important as providing SME owner/managers with information, specific to their sector, about the prevalence of psychological distress, related work attendance behaviour, and which work and non-work variables may influence these decisions. This may in turn aid the development of best practice guidelines for



managing psychological distress, both theirs and their employee's, within small business settings.

At the time of submission of this thesis, the contents of this chapter had been submitted as a manuscript to the European Journal of Work and Organisational Psychology.

## **5.2 Introduction**

Occupational health and epidemiology research have consistently demonstrated that depression is one of the most costly health problems in the labour force (3-6). In addition to the substantial health care resources required to treat depression, the disease impacts workers' behavioural, cognitive, emotional, interpersonal, and physical functioning, leading to excess disability and sickness absence (7, 8), as well as impaired work ability (9). Therefore, a large proportion of the costs associated with depression can be attributed to lost workdays due to absence and the reduced productivity of individuals who continue working when ill (presenteeism) (6). Further, individuals experiencing depression are more likely to continue working than individuals with other health conditions (7). This means the cost of depression-related presenteeism is particularly high with annual estimates reaching \$44 billion dollars in the US (6), 15.1 billion pounds in the UK (8) and \$12.6 billion dollars Australia (11).

### **5.2.1 Background and Rationale for the Study**

Despite the recognised economic impact of depression-related presenteeism, relatively few studies have attempted to identify which work-, non-work-, or health-related factors are associated with continued work attendance amongst workers reporting depression. As a result, employers, business owners and occupational health professionals may struggle to understand and manage this behaviour, and the associated costs, due to limited information regarding which influential factors are amenable to change and/or intervention. Whilst all employers, managers, and employees could benefit from increased research efforts to identify the precipitants of depression and improve understanding of the associated consequences, one sector

that has been particularly neglected by occupational health research is the small to medium enterprise (SME) sector.

An evidence base to protect and promote the organisational health and productivity of SMEs is critical, as SMEs account for 99.9% of all businesses in the UK (12) and 99.2% of all businesses in Australia (13, 14). Figures are similar in the US where the nation's 6 million SMEs represent 50.2% of its private-sector employment (15). SMEs also contribute significantly to continued global economic growth as they are responsible for a large proportion of new jobs growth and their smaller size allows them greater flexibility to accommodate market demands or respond to competitive dynamics. Therefore, improved management of depression and related work attendance behaviour in this setting is vital (16). This could be achieved via development of practice guidelines and tailored mental health promotion programs informed by an understanding of which work and non-work factors prompt sickness absenteeism and whether these factors are specific to the SME sector. Such measures have the potential to benefit employees, employers and economies worldwide through investment in the continued productivity of the SME workforce.

Improving our understanding of the influences upon work attendance decisions amongst individuals experiencing depression, may have important implications for SME owner/managers. Organizational features common in SMEs such as multiple roles, long work hours and the emotional and financial commitment made by owner/managers, may increase their susceptibility to role ambiguity, overload, work/life imbalance and family disharmony, and financial pressure, all of which are identified precipitants of job stress and burnout (17), and depression (18-22). That said, research has identified certain personality factors that attract SME owner/managers to the sector, and these factors may improve their ability to cope with the aforementioned pressures. For example, greater resilience, high self-efficacy (a facet of psychological capital), and an internal locus of control, common in SME owner/managers and entrepreneurs, may act as a buffer to the deleterious effects of stress and, by extension, burnout and depression (52).

Depression-related presenteeism may also be more common in SMEs, and the subsequent costs and long-term health consequences may be more keenly felt, as magnified work attendance pressures motivate SME owner/managers to continue

working more than they would in larger organizations. Additionally, various individual and organisational characteristics unique to SMEs, and SME owner/managers, may increase related productivity loss. For example, high presenteeism rates may arise as small teams rely on interdependent worker productivity which prompts individuals to continue working when unwell (23, 24). This same small team factor may make it difficult for co-workers or managers to compensate for the diminished work capacity of a worker who continues to work whilst ill, thus increasing the subsequent cost.

A small amount of research has identified lower absenteeism rates in SMEs as compared to larger organisations. This could be due to a greater sense of responsibility felt towards co-workers and employees or, for owner/managers, the regular adoption of multiple role responsibilities which render them unable to compensate for lost productive time thus making absenteeism a less attractive option when sick (25, 26). Alternatively, a strong connection to the wellbeing of the company (27), promoted by the lack of anonymity experienced within SME work teams, fosters a “family” environment which may reduce the extent to which sickness absence is taken. Moreover, the more reciprocal relationship between individual and organisational performance, as compared to larger organizations, may discourage sickness absence (28-30). Finally, SME owner/managers, particularly sole-traders, may experience pressure to attend work when ill to ensure the continued viability and productivity of their business.

Others have adopted an economic perspective to explain the relationship between organisation or firm size and sickness absenteeism. Coles and Treble (31) suggest potential productivity losses due to absenteeism are lower in larger organizations as they can insure against absence at a lower cost. As a consequence, absenteeism is expected to be higher in larger firms as they have back up human capital to compensate for absent workers (31). Therefore, team production acts as an insurance device in larger firms by increasing the likelihood that there will be a minimum number of employees present to complete the work. Barmby and Stephan (25) support this position and add that larger firms can further diversify their risk of worker absence by having “back up” workers who are equally skilled or trained and can fill in for their sick or absent colleague.

To date, no known studies have investigated the prevalence of depression or high psychological distress, an identified predictor of clinical diagnoses of anxiety and affective disorders (1, 2), or the predictors and/or consequences of related work attendance behaviour in an SME setting. Further, recent Australian research indicated that only 25% of managers reported receiving training from their organization on mental health issues, and only 33% had a clear policy on mental health despite the fact that 43% considered depression a suitable topic to discuss at work (32). These problems may be particularly pronounced in SMEs as strategies such as Employee Assistance Programs, mental health literacy workshops or stress management training may be difficult to implement and are infrequently carried out within SMEs in contrast to larger organisations (33). As a result, occupational health literature lacks information, specific to the SME sector, regarding the impact of depression and related absenteeism and presenteeism. This may inhibit the development of and/or participation in occupational health programs designed to manage depression and reduce the associated health and economic consequences in this sector.

### **5.2.2 Theoretical Approach**

Within the literature investigating the antecedents of absenteeism, several studies have identified organization or firm size as being positively correlated with absenteeism (23, 25, 27, 30, 34-39). Consequently, the prevalence of presenteeism may be much higher in SMEs as absenteeism behaviour is less likely as a response to mental health issues and reduced coping with work-related stress. However, only Hansen and Anderson (40), in their study of a random sample of the Danish workforce, have demonstrated an association between firm size and presenteeism, and this was not specific to working individuals experiencing depression.

This study attempted to address the aforementioned dearth of SME-specific literature by performing, to our knowledge, the first exploratory analyses of the occurrence and consequences of high/very high psychological distress amongst a sample of SME owner/managers. Data were taken from 143 SME owner/managers participating in the baseline phase of a randomised controlled trial of a workplace mental health promotion program (41). Firstly, it identified the proportion of participating SME owner/managers reporting high/very high psychological distress. Secondly, it aimed

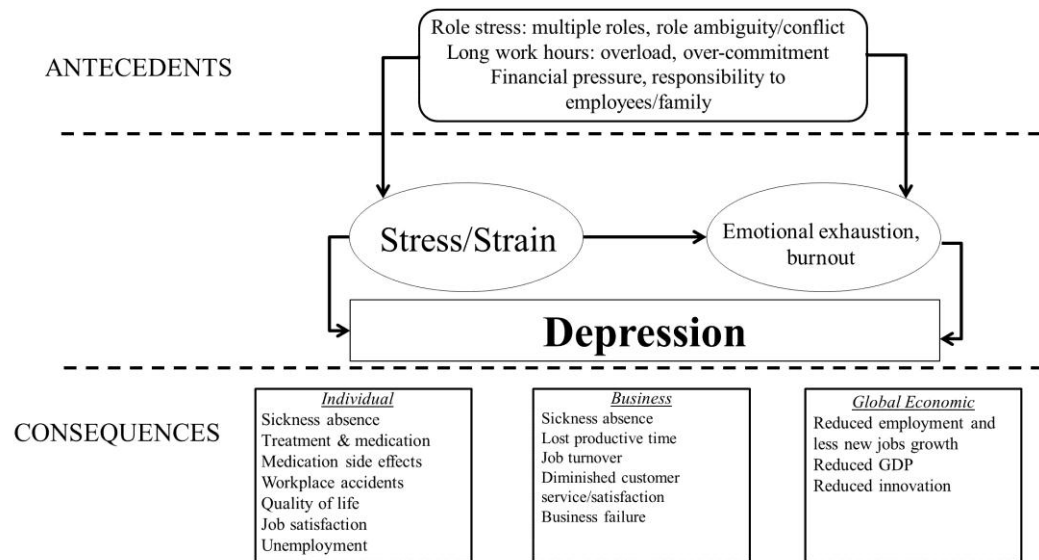
to identify the prevalence of past-month sickness absenteeism and presenteeism days reported within this sample of SME owner/managers reporting high/very high psychological distress, and the associated, self-reported lost productivity. Finally, this study aimed to identify which work, non-work and SME-specific factors are associated with these work attendance behaviours within this sample of SME owner/managers reporting high/very high psychological distress. In doing so it aimed to test several hypotheses.

**Hypothesis 1:** A large proportion of SME owner/managers in our sample will report high/very high psychological distress due to the pressures associated of owning and managing an SME and the lack of information, support and time available to manage these pressures.

**Hypothesis 2:** Due to magnified work attendance pressures, SME owner/managers experiencing high/very high psychological distress will report more presenteeism days than absenteeism days

A model was developed (Figure 5-1) to conceptualise how various individual and business characteristics, and work and non-work factors may contribute to the development of depression and psychological distress in SMEs, and how they may influence related work attendance decisions. This model's development was informed by recent research which suggested presenteeism should not be examined in isolation, but with reference to the significant knowledge already acquired through absenteeism related research (42, 43). Therefore, the factors included in the model were informed by Aronsson's (43) theoretical model for research into sickness presenteeism which suggests sickness absenteeism and presenteeism are alternatives of the same decision process. Therefore, to understand work attendance behaviour consideration of the predictors and consequences of both outcomes is necessary. Factor selection was also informed by Hansen and Anderson's (40) model which schematizes the influence of organizational and individual factors on work attendance decisions, and the literature review and the model offered by Johns (44), which suggests certain features of the work context, characteristics of the worker, and work experiences may influence absenteeism and presenteeism decisions. This model was used to identify which potential correlates of absenteeism and presenteeism amongst SME owner/managers reporting high/very high psychological

distress would be explored in this study and underlies four key research hypotheses linked to each set of variables studied.



**Figure 5-1.** Potential antecedents and consequences of depression in small-to-medium enterprise owner/managers.

*Socio-demographic factors:* Socio-demographic factors were age, gender and education. Middle-aged workers, females and those with post high school education have been more likely to report presenteeism behaviour (40, 43, 45). Similar associations are expected in this study.

**Hypothesis 3:** Amongst those reporting high/very high psychological distress, middle-aged SME owner/managers, female owner/managers and those with a post-high school education will report more presenteeism days.

*Individual characteristics:* Johns (42) posited that presenteeism is in part due to “perseverance in the face of adversity” and suggested attitudes, values and personality variables are all likely to influence an individual’s decision to continue working when ill. This suggestion was informed by reported associations between presenteeism and psychological hardiness, conscientiousness and the inability to refuse the demands of others, known as “individual boundarylessness” (43). The current study incorporated conscientiousness into its investigation of potential correlates of absenteeism and presenteeism. Conscientiousness was selected due to its negative relationship to absenteeism (46-49) which, if we employ Aronsson’s (43)

model, may indicate a positive relationship with continued work attendance. Features of conscientious individuals that may prompt continued work attendance when ill include dependability, reliability, responsibility, and thoroughness (50). Further, entrepreneurs and small business owners have been shown to score higher on conscientiousness when compared to other professionals (51, 52) thus increasing affective commitment to their employees and their business and potentially prompting presenteeism.

**Hypothesis 4:** Amongst those reporting high/very high psychological distress, conscientiousness will be positively associated with presenteeism and negatively associated with absenteeism.

*Business characteristics:* Business characteristics selected for investigation were whether the owner/managers supervised employees, firm size, and hours worked per week. Firm size was included as a potential correlate of presenteeism as (23, 24) smaller work teams and inter-dependent co-worker productivity may influence work attendance decisions as managers who cannot rely on the back up of multiple employees may be more likely to continue working when ill to reduce the potential lost productive time (24, 53). Whether or not an owner/manager supervised employees and work hours were also considered and expected to be positively associated with presenteeism. Individuals who work in a supervisory role and/or routinely work a higher than average numbers of hours per week are likely to feel under greater time pressure if they take time off for illness (40). That is, they may be reluctant to take time off work when as their work tasks are likely to accumulate in their absence (43). Additionally, the sense of responsibility that comes with a supervisory role may prompt continued work attendance. Qualitative research has also suggested team designs foster work attendance pressure, either from colleagues or subordinates demanding attendance (54) or from the individual themselves, not wanting to disappoint their colleagues (55). Further, team designs are often heavily reliant on task interdependence where one worker's output is dependent on their colleague's output. Johns (42) posited that task inter-dependence is likely to be negatively correlated with absenteeism and positively correlated with presenteeism. Such pressures are likely to be magnified in SMEs as managers and employees will be more dependent on each other as there are fewer people to take on the tasks of a sick colleague.

**Hypothesis 5:** Amongst those reporting high/very high psychological distress, supervising employees and work hours will be positively associated with presenteeism, and firm size will be positively correlated with absenteeism.

*Work-related wellbeing factors:* A wide range of factors related to wellbeing at work have been associated with absenteeism. These include role ambiguity (56, 57), an element of job tension, work overload and poor work life balance (56), and low job satisfaction (58, 59). Work/life balance (60) and job satisfaction (59) have been associated with presenteeism. Bockeman and Laukkanen (45) used self-reported mismatch between desired and actual working hours to reflect work/life balance and found that poor work life balance increased the prevalence of sickness presenteeism. This is of particular interest as poor work/life balance is a commonly cited by-product of SME management or ownership (61, 62). Caverley (59) explored the relationship between absenteeism, presenteeism and the following work-related wellbeing factors relating to security, support and work demands: job tension, job satisfaction, and work/life balance. Also included was a measure of business confidence as a SME-specific indicator of job security with the potential to influence work attendance decisions. Job insecurity stemming from downsizing and restructuring, or in the case of SMEs, low business confidence and impending business failure, forces exaggerated levels of attendance or presenteeism (63).

**Hypothesis 6:** Amongst those reporting high/very high psychological distress, low business confidence, work/life balance, low job tension and high job satisfaction will be positively associated with presenteeism.

*Health-related factors:* Health-related factors chosen for exploration were psychological treatment and self-rated health. Cocker et al (64) reported that receiving treatment for depression was negatively correlated with presenteeism and having excellent, very good or good self-rated health was positively correlated with presenteeism. Further, Cocker et al (64) suggest this finding may indicate that individuals reporting presenteeism may be the less disabling cases of depression. Similar findings are expected in the SME setting.

**Hypothesis 7:** Amongst those reporting high/very high psychological distress, self-rated health will be positively correlated with presenteeism and receiving treatment will be negatively correlated with presenteeism and positively correlated with absenteeism.



## **5.3 Method**

### **5.3.1 Participants, sampling and recruitment procedures**

As part of a larger study examining the feasibility and efficacy of a workplace mental health promotion program targeted at small-to-medium enterprise (SME) owner/managers, baseline data prior to intervention was available for analysis. To be eligible to participate in the study, owner/managers needed to be in a managerial role within a business employing less than 200 employees, be over 18 years of age and have access to a telephone and computer/DVD player, to be used for delivery of the intervention materials.

Data in this paper comes from the first 143 consecutive enrollees in the trial. Data were from both owners and managers who were aggregated into one group, “owner/managers”. The majority of respondents identified themselves the business owner, CEO or director (68%). The remaining 32% identified themselves as senior managers, with a high level of responsibility regarding the day-to-day running of the business, and subject to many of the same operational, workplace stresses as the SME owners. Therefore, aggregation is unlikely to influence the results of this study. Whilst differences between entrepreneurs and small business owners in terms of creativity and risk taking propensity are of cited (65, 66), recent research suggests there are fewer differences between small business owners and managers, and that small business owners are more comparable to managers than to entrepreneurs. (67). Further, a series of one-way ANOVAs revealed no significant differences between owners and managers reporting high/very high psychological distress on any of the correlates of absenteeism and presenteeism explored in this study or the number or occurrence of sickness absence and presenteeism days.

As we used various, diverse avenues of recruitment the population used in this study should be considered a convenience sample and is in no way structured to be representative of the broader, Australian SME population. It is therefore not surprising that the sample was different to the source population of Australian SMEs in terms of percent female, and industry (Table 5-1). In comparison to Australian

comparative data, our sample was more likely to be female, and from the health industries.

**Table 5-1** Sample characteristics of Business in Mind participants compared to Australian Bureau of Statistics, SME demographic information.

Sample Characteristics	Business in Mind	Australian Bureau of Statistics
<i>Age</i>	43.3% - 40-49 years	28.2% - 45-54 years
	22.5% - 50-59 years	26.8% - 35-44 years
	17.6% - 30-39 years	14.3% - 55-59 years
	8.5% - 18-29 years	12.1% - 25-34 years
	7.9% - 60-69 years	<10% - 65 and over <10% - 25 and under
<i>Gender</i>	72% female	31.5% female
<i>Industry</i>	35% - other	83.1% - service
	16.8% - service	10.2% - agriculture, forestry, fishing
	15.3% - health	4.1% - manufacturing
	6.6% - building & construction	0.4% - mining
	5.1% - retail	
	4.4% - innovation, science, tech.	
	4.4% - finance	
	3.6% - manufacturing	
	2.9% - transport	
	2.2% - agriculture	
	2.2% - tourism	
	1.5% - wholesale	

### 5.3.2 Measures

#### *Kessler (K10) Screening Scale for Psychological Distress*

The Kessler 10 (K10) Screening Scale for Psychological Distress measured current psychologist distress. This 10-item measure asks about the level of anxiety and depressive symptoms a person may have experienced in the four weeks prior to completing an interview or questionnaire. For example, “In the past four weeks, how often did you feel tired out for no good reason” and “In the past 4 weeks, how often did you feel nervous”.

Each item is measured on a five-level response scale: none of the time (1), a little of the time (2), some of the time (3), most of the time (4), and all of the time (5). Scores

of the ten items are summed, yielding a minimum possible score of 10 and a maximum possible score of 50. Low scores indicate low levels of psychological distress and high scores, high levels of psychological distress. The scores in our study were grouped according to the criteria developed by Andrews and Slade (1) into four levels of psychological distress: low (10-15); moderate (16-21); high (22-29); very high distress ( $\geq 30$ ). These cut off scores were used in the 2000 Health and Wellbeing Survey (conducted in Western Australia), and the Australian Bureau of Statistics' (ABS) 2001 National Health Survey, to estimate levels of psychological distress (30, 68). For the current analysis, the K10 was dichotomised at low to moderate levels of distress ( $K10 \leq 21$ ) versus high to very high levels of psychological distress ( $K10 \geq 22$ ) (69). This categorisation was chosen as high to very high levels of psychological distress have been shown to be associated with clinical diagnoses of anxiety and affective disorders (1, 2).

The K10 was developed based on extensive psychometric analyses, in large general population samples, using modern item response theory methods to maximize the scale's precision and to ensure each item in the scale had consistent severity across socio-demographic subsamples (70). It is regularly used in population health surveys to measure psychological distress and has greater discriminatory power in detecting DSM-IV depressive and anxiety disorders than other short general measures, such as the General Health Questionnaire (GHQ-12) (71).

#### *Absenteeism and presenteeism days and related lost productive time:*

Absenteeism days were measured using an item from the World Health Organizations Health and Work Performance Questionnaires (HPQ). Specifically, "In the past 4 weeks, on how many days did you miss a whole day of work because of problems with your physical or mental health?" (72, 73). HPQ validation studies show good concordance between measures of self-reported absenteeism and pay-roll records over a 30-day recall period (73, 74). Further, these types of recall-based questions have been typically used in previous studies to establish absenteeism rates for mental disorders (75). Using this question also allowed the examination of the correlates of absenteeism amongst owner/managers with high/very high psychological distress as a continuous (number of days) and a dichotomous (none/any) measure.

Our presenteeism measure, like the absenteeism measure, had a 4-week recall period. The first presenteeism measure determined the number of days an owner/managers attended work while suffering from a health problems/s (presenteeism days). This was assessed by the item “How many days in the last 4 weeks did you got to work while suffering from health problems?” (76). The responses to this item were dichotomised and used as the outcome in our regression analyses. Owner/managers also provided a self-reported estimate of lost productive time associated with their presenteeism days, on a vertical scale from 0-100%, in answer to the item “On these days, when you went to work suffering from health problems, what percentage of you time were you as productive as usual?”. Therefore the measure of presenteeism days could be adjusted by a percent rating of perceived productivity (77) to estimate lost productivity from being at work when sick (78). This measure was used to assess the mean lost productive time reported for owner/managers reporting low/moderate psychological distress compared to those reporting high/very high psychological distress. These measures have been validated in population of employed, individuals reporting symptoms of depression and anxiety (7). The correlates of presenteeism as a continuous (number of presenteeism days) and dichotomous (none/any) measure were examined.

### *Socio-demographic factors*

Sex (male, female), age and education were included in the analyses. Age was initially grouped as 18-29 years, 30-39 years, 40-49 years, 50-59 yeasts, and 60-69 years and 70+ years. However, due to small numbers, age was collapsed in to three categories (18-39 years, 40-49 years, and 50+ years). Similarly education was reduced from five groups (secondary school, higher school certificate/matriculation, diploma/associate diploma, university degree and other) to two (post high-school, no post high-school). This classification has been used in previous studies (64).

### *Individual characteristics*

Conscientiousness was measured at baseline using a five-item measure from the NEO Personality Inventory-Revised (NEO-PI-R) (78). The validity and reliability of this measure has been tested in studies of occupational samples (80, 81).

*Business characteristics*

Number of employees supervised (“How many employees you directly supervise in your current team”) was categorised as none vs. any employees. Number of employees within an organization was measured in response to the “How many employees work in your business/organization (full time equivalent)”. Responses were categorised as no employees, 1-4 employees, 5-19 employees, and 20-199 employees. Hours worked was also included and was determined in response to the item “How many hours, on average, do you work each week?”. Due to relatively small numbers responses were then categorised as 0-40 hours and 40 hours or more hours.

*Work-related wellbeing factors*

Business confidence was measured by owner/managers indicating, on a 6-point scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree), their level of agreement with the statement “I feel confident about the business’ performance over the next 12-months”. Responses were then categorised into confident (somewhat agree, agree, strongly agree) and not confident (somewhat disagree, disagree, strongly agree). Job satisfaction (82) was assessed by a 3-item measure which required owner/managers to indicate their level of agreement (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) with the following statements “Overall, I am satisfied with the kind of work I do”, “Overall, I am satisfied with the organisation in which I work” and “Overall, I am satisfied with my job”. Job tension (83) was assessed by a 4-item measure which required owner/managers to indicate their level of agreement (strongly agree, somewhat agree, agree, somewhat disagree, disagree, strongly disagree) with the following statements “My job tends to directly affect my health”, “I work under a great deal of tension”, “I have felt fidgety or nervous as a result of my job” and “If I had a different job, my health would probably improve”. Work/life balance (84) was determined by a 4-item measure which required owner/managers to indicate their level of agreement, time on a 7-point scale (strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree), to statements such as “I currently have a good balance between the time I spend at work and the time I have available for non-work activities” and “I have difficulty balancing my work and non-work activities”.

### *Health-related factors*

A single item measure, the first item of the SF-12, assessed general self-rated health. This is a general indicator of self-reported health (85), which has been validated as a measure of general health status in various populations (86, 87). Self-rated health is related to important health outcomes including health risk behaviours, disability and mortality (84), and demonstrates good reliability and reproducibility (86). Treatment was measured by participant responses regarding the receipt of professional medical help for a mental health concern in the three months prior to the survey. Specifically, responses to the item “Have you sought help from a professional in the past three months for a mental health concern”. If owner/managers answered affirmatively they were asked to specify whether that professional was a general practitioner, psychologist, or other type of health professional.

### 5.3.3 Statistical Methods

Once the proportion of SME owner/managers reporting low/moderate and high/very high psychological distress was identified (Hypothesis 1), the mean past-month sickness absenteeism days and presenteeism days and related standard deviations were calculated (Hypothesis 2). Average self-reported lost productive time, expressed as the percentage of time SME owner/managers thought they were as productive as usual when they continued to work whilst ill, was also calculated for owner/managers reporting low/moderate and high/very high psychological distress (Hypothesis 2).

Negative binomial regression was used to demonstrate the independent effects of socio-demographic, work-related wellbeing and health-related factors, as well as various individual and business characteristics on continuous measures of absenteeism and presenteeism days (Hypotheses 3-7). This analysis was chosen as absenteeism and presenteeism days were both count variables with skewed distributions (Table 5-3). This method has been used in previous studies exploring the correlates of these work attendance behaviours (42).

## 5.4 Results

Mean absenteeism and presenteeism days and the proportion of owner/managers reporting absenteeism and presenteeism (none versus. any) were calculated for all participating owner/managers, and by psychological distress category (low/moderate versus high/very high) (Table 5-2).

The mean percentage of self-reported inefficiency was calculated for owner/managers in both psychological distress categories (low/moderate versus high/very high) reporting any presenteeism days (Figure 5-2).

### 5.4.1 Psychological Distress

Within our sample of 143 owner/managers, 60.8% (n=87) met criteria for low/moderate psychological distress as measured by the K10 Psychological Distress Scale. Approximately 40% (n=56) met criteria for high/very high psychological distress (Hypothesis 1).

### 5.4.2 Past month sickness absenteeism and presenteeism by psychological distress

Table 5-2 displays the prevalence of psychological distress by work attendance behaviours and reported inefficiency (Hypothesis 2). Firstly reported is the incidence of absenteeism and presenteeism, whether or not any absenteeism and presenteeism days were reported, followed by the mean number of absenteeism and presenteeism days for those owner/managers reporting low/moderate psychological distress (N=87) compared to those reporting high/very high psychological distress (N=56) as well as for the total sample (N=143).

Just under 70% (n=96) of SME owner/managers reported attending work when ill in the previous month and almost 30% (n=42) reported past month absenteeism. SME owner/managers reporting high/very high psychological distress reported taking a sickness absence more than those with low/moderate psychological distress. Specifically, 40% of owner/managers reporting high/very high psychological distress reported past-month sickness absence. SME owner/managers reporting high/very high psychological distress also reported more past-month presenteeism (n=47;

83.9%) than those with low or moderate psychological distress. Further, of those owner/managers reporting high/very high psychological distress 83.9% reported attending work when ill compared to just 42.9% who took a sickness absence.

Owner/managers reporting high/very psychological distress also reported, on average, more absenteeism ( $M=3.4$ ,  $S.d.=1.5$ ) and presenteeism days ( $M=10.9$ ,  $S.d.=1.2$ ) than those reporting low/moderate psychological distress [absenteeism days ( $M=0.5$ ,  $S.d.=0.2$ ); presenteeism ( $M=3.9$ ,  $S.d.=0.7$ ).

**Table 5-2** Proportion of absenteeism and presenteeism days and mean absenteeism and presenteeism days amongst SME owner/managers by psychological distress category.

	All Owner/Managers (N=143)		Owner/Managers with Low/Moderate Psychological Distress (N=87)		Owner/Managers with High/Very High Psychological Distress (N=56)	
	N	%	N	%	N	%
Absenteeism						
Yes	42	29.4	18	20.7	24	42.9
No	101	70.6	69	79.3	32	57.1
Presenteeism						
Yes	96	67.1	49	56.3	47	83.9
No	47	32.9	38	43.7	9	16.1
	Mean	S.d.				
Absenteeism Days	1.6	0.5	0.5	0.2	3.4	1.5
Presenteeism Days	6.6	0.7	3.9	0.7	10.9	1.2

#### 5.4.3 Total absenteeism and presenteeism by psychological distress

Negative binomial regression models were used to determine the correlates of total absenteeism and presenteeism days (Table 5-3). Mean absenteeism and presenteeism days are reported for those variables for which a significant association was identified (Table 5-4).



**Table 5-3** Antecedents and correlates of absenteeism and presenteeism.

Variable	Total Absenteeism Days	Total Presenteeism Days
	$\beta$	$\beta$
Age	-0.73*	-0.19
Gender	1.52**	0.23
Education	1.05	0.36
Employees supervised	0.44	-0.08
Firm size	0.81	0.07
Work hours	0.15	-0.34
Treatment	1.51**	0.56**
Self-rated health	0.01	2.08***
Business confidence	0.07	-0.009
Job tension	-0.63*	0.08
Job satisfaction	0.07	-0.34
Work/life balance	1.22*	0.31
Conscientiousness	-0.62*	0.03

\* $p < 0.1$  \*\*  $p \leq 0.05$ . \*\*\*  $p \leq 0.01$ .

Note. Total absenteeism and presenteeism days analysed with negative binomial regression.

#### 5.4.4 Correlates of absenteeism and presenteeism

**Absenteeism Days:** Treatment was positively associated with past-month absenteeism ( $\beta = 1.51$ ,  $p=0.012$ ). Gender was also associated with absenteeism as women were more likely to report absenteeism than men ( $\beta = 1.52$ ,  $p=0.01$ ). Non-significant trends were also identified; job tension ( $\beta = -0.63$ ,  $p=0.084$ ) and conscientiousness ( $\beta = -0.61$ ,  $p=0.056$ ) were negatively associated with absenteeism and work/life balance was positively associated with absenteeism. Specifically, SME owner/managers who rated low on conscientiousness reported, on average, almost 6 times to number of past-month absenteeism days compared to those who rated medium or high conscientiousness. SME owner/managers reporting high job tension reported less absenteeism days than owner/managers who reported low or medium job tension. Compared to SME owner/managers reporting a poor work life balance, those reporting a good balance between work and life reported more absenteeism days.

**Presenteeism Days:** Analyses revealed that treatment ( $\beta = 0.56$ ,  $p=0.04$ ) and self-rated health ( $\beta = 2.08$ ,  $p<0.0001$ ) were positively associated with total presenteeism days. Owner/managers with excellent, very good or good self-rated health reported

almost 12 times the average number of presenteeism days than owner/managers with fair or poor self-rated health.

**Table 5-4** Mean absenteeism and presenteeism days by factors identified as significantly associated these work attendance behaviours.

Variable	Mean	Mean
	Absenteeism Days	Presenteeism Days
	M (S.d.)	M (S.d.)
Age		
18-39 years	5.5 (3.8)	
40-49 years	2.7 (1.1)	
50+ years	1.3 (0.5)	
Gender		
Male	1.2 (0.6)	
Female	5.4 (2.7)	
Treatment – 3 months		
No	1.4 (0.5)	8.4 (1.5)
Yes	6.4 (3.6)	14.7 (1.6)
Self-rated health		
Fair/Poor		1.5 (0.7)
Excellent/Very/Good		12.0 (1.2)
Job tension		
Low	11 (9.9)	
Medium	1.6 (1.0)	
High	2.3 (0.7)	
Conscientiousness		
Low	6.3 (3.7)	
Medium	0.8 (0.4)	
High	1.9 (0.6)	
Work/life balance		
Low	2.2 (0.6)	
High	7.6 (6.5)	

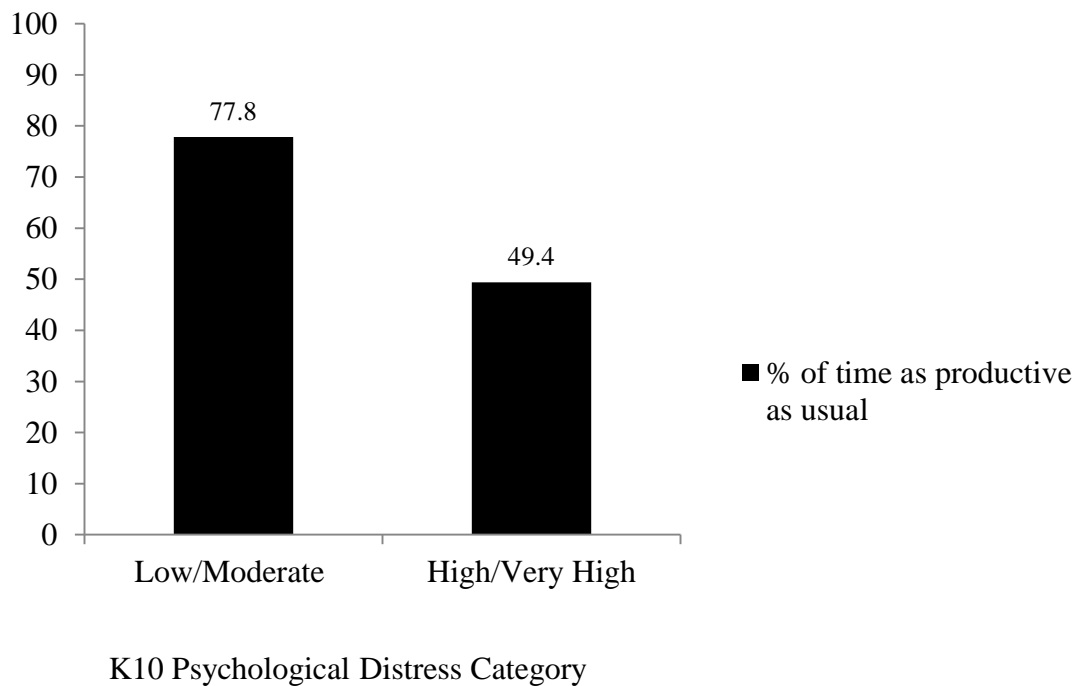
\* $p < 0.1$  \*\*  $p \leq 0.05$ . \*\*\*  $p \leq 0.01$ .

*Note.* Total absenteeism and presenteeism days analysed with negative binomial regression.

#### 5.4.5 Inefficiency due to presenteeism by psychological distress

SME owner/managers reporting presenteeism days were also asked to report their degree of inefficiency, or productivity loss, on the days they attended work when ill. Figure 5-2 represents the mean inefficiency for the total sample by K10

Psychological Distress category. Reported inefficiency varied considerably between those owner/managers in the low/moderate psychological distress category as compared to those owner/managers in the high/very high psychological distress category; that is substantial productivity loss occurs amongst owner/managers reporting very high psychological distress.



**Figure 5-2.** Inefficiency amongst SME owner/managers reporting past month presenteeism by psychological distress.

## 5.5 Discussion

The lack of current SME-focused mental health promotion strategies may be due to the dearth of research identifying which, if any, SME-specific factors prompt psychological distress and depression, the related work attendance behaviours, and associated health and economic consequences. This study attempted to address this research gap. It used self-report data from a sample of SME owner/managers to identify the proportion reporting high psychological distress, the number of past-month absenteeism and presenteeism days reported, the degree of inefficiency associated with continued work attendance, and which socio-demographic, work-related wellbeing, and health-related factors, as well as individual and business characteristics, that were associated with absenteeism and presenteeism days.

Results revealed 39.2% (N=56) of participating owner/managers reported high/very high psychological distress, almost half of whom reported past month absenteeism (42.9%) and the majority reported attending work when ill (90%). This supports our hypotheses that due to the pressures associated of owning and managing an SME and the lack of information, support and time available to manage these pressures the proportion of SME owner/managers reporting high/very high psychological distress will be higher than that identified in the general working population. Further, this finding support our hypothesis that SME owner/managers experiencing high/very high psychological distress will report more presenteeism days than absenteeism days due to magnified work attendance pressures. Owner/managers in the high/very high psychological distress categories reporting presenteeism also estimated that they were as productive as usual just fewer than 50% of the time. Factors associated with presenteeism days were treatment from a general practitioner, psychologist or other professional for a mental health issue in the 3 months prior to completing the survey and self-rated health. Female owner/managers, those who had received treatment, were less conscientious, reported lower job tension and a better work/life balance reported more absenteeism days. No SME-specific factors, related to either the SME owner/managers or their businesses, were associated with absenteeism or presenteeism days.

Although we failed to identify any SME specific factors correlated with presenteeism, we did identify an association between receiving treatment and work attendance that was at odds with the findings from previous investigations of presenteeism correlates. Cocker et al (2011) (64) found that within a population of employed Australian adults reporting lifetime major depression, treatment was negatively associated with presenteeism. Further, as absenteeism was measured as the converse of presenteeism, treatment was positively associated with taking a sickness absence. However, in our sample SME owner/managers who reported receiving treatment from a GP, psychologist or other health professional for a mental health issue in the 3 months prior to the survey reported more absenteeism and presenteeism days than those who had not sought treatment during that period.

Cocker and colleagues (64) suggested the association with absenteeism may be due individuals receiving treatment experiencing more severe symptoms, which require them to seek treatment and compel their absence from work. By extension they

suggest presenteeism reporters are the milder cases of depression (64). Although treatment is positively correlated with presenteeism in this study the relationship was not as strong as that between treatment and absenteeism, suggesting the aforementioned explanation may still be applicable. Using our understanding of the work attendance pressures SME owner/managers experience, we could hypothesise that SME owner/managers receiving treatment are in fact the more severe cases of depression but due to various individual and organisational features, which compel their presence they continue to work, whereas the same circumstances in a larger organisation may allow absence. Therefore, special attention should be paid to owner/managers reporting high/very psychological distress as they are likely to continue working which may have potentially significant consequences in terms of the long term health of the individual, as well as significantly impact the profitability and sustainability of their business due to their reduced capacity to work productively.

That said, it must be considered that the dissimilarity in the findings of Cocker et al (2011) and the present study may be explained by the difference in the way presenteeism was operationalized. Specifically, Cocker et al (2011) defined presenteeism as the absence of absenteeism and therefore absenteeism and presenteeism were mutually exclusive outcomes categories. That is, respondents could be in one or the other, not both. Further, absenteeism and presenteeism reported was in reference to the 12 months prior to the survey interview. However, the SME owner/managers in this study were asked two separate questions about whether they experienced past-month absenteeism and past-month presenteeism and could therefore report experiencing both absenteeism and presenteeism.

The strong positive correlation identified between better self-rated health and presenteeism days more convincingly supports the suggestion that individuals who continue to work whilst experiencing high psychological distress are experiencing less disabling symptoms, and thus more able to work. Despite reporting high/very high psychological distress, rating their health as favourable was a more powerful correlate of continued work attendance for participating owner/managers. This is consistent with previous findings which suggest an individual's decision to continue working is strongly conditional on their self-assessed health level (89). This is likely to be the case for SME owner/managers who, due to features such as small work

teams and multiple role responsibilities, are unable to rely on colleagues or employees to compensate for the lost productivity their sickness absence would yield. However, despite considering their self-rated health adequate enough to rule out taking a sickness absence those owner/managers who continued to work whilst experiencing high/very high psychological distress reported substantially reduced productivity. Consequently, ratings of psychological distress should be considered before self-rated health scores when identifying which owner/managers should be the initial targets for future workplace mental health promotion strategies and interventions. Alternatively, this finding may also suggest incorporating mental health into general health promotion strategies could be effective as physical health may buffer the relationship between psychological distress and work attendance.

### 5.5.1 Limitations

Research trials often yield samples unrepresentative of the general population and the baseline data analysed here revealed this sample is no exception (Table 5-1). For example, we have a higher proportion of women than in the broader SME population. This may be explained by the consistent research finding that women experiencing depression are more likely to disclose symptoms and seek treatment (90-92), or in the case of this study, enter an intervention trial evaluating a workplace mental health promotion tool. This elucidation is supported by the findings of a recent, national survey of mental disorder prevalence which reported approximately 40% of women with a mental disorder reported service use compared to 28% of men (93).

The distribution of participating owner/managers by industry also differed from the most recently released nationally representative SME information (Table 5-1). For example, almost 16% of our sample works in the health industry (Table 5-1), which could suggest they are more health, and mental health, literate. Health literacy refers to is the knowledge and skills needed to understand and use information relating to health issues and staying healthy (95). Mental health literacy has been defined as ‘knowledge and beliefs about mental disorders which aid their recognition, management or prevention’ and includes the ability to recognise specific disorders, knowing how to seek mental health information, knowledge of risk factors and causes, and professional help available, and attitudes that promote recognition and

appropriate help-seeking (96). Such skills and knowledge of mental health may serve to differentiate the SME owner/managers in this study from the broader SME population who may not be as able to recognise, manage, seek help for or prevent mental health difficulties. Further, the mental health literacy of the participating owner/managers may have prompted their decision to participate in the intervention program, meaning there are likely to be SME owner/managers who aren't health literate and therefore did not engage with the program, for whom the stress involved in running a small business, and the subsequent psychological distress, work attendance behaviours and lost productive time are even more pronounced.

Therefore, the sample analyses in this study are not representative of the broader small business community. Subsequently, the prevalence estimates are unable to be generalised to SMEs nationwide. Future research should aim for a systematic sampling procedure in order to achieve a representative sample and remove these aforementioned biases.

The representativeness of the sample used in this study may have also been compromised during the recruitment and registration stages of the program. A large proportion of owner/managers who registered to participate reported doing so as they had experienced mental health difficulties, or their staff had. This may have produced an over-estimate of psychological distress within our sample and the findings cannot be considered representative of SME owner/managers beyond those who volunteered to participate in our mental health promotion intervention. However, as this is the first research of this type to be conducted in a SME setting it is an important starting point and indicates the need for more research to be conducted with a more representative sample.

Another potential limitation of this study, which was dictated by the small sample size, is the aggregation of SME owners and managers into one group. That is, differences between owners and managers in terms of personality traits or characteristics and their level of personal and financial involvement in the business have the potential to affect their probability of experiencing high/very high psychological distress and influence their work attendance decisions. For example, a manager of a SME may experience a sense of belonging and personal commitment to the business, driven by the small work terms and a close working relationship with

the business owner, which may compel presenteeism. However, owners may be even more motivated to continue working when sick in order to prevent lost productive time due to sickness absence as they also have a financial stake in the continued profitability and sustainability of the business. That said, 68 % of SME owner/managers in this study identified themselves the business owner, CEO or director. The remainder were senior managers, who reported a high level of responsibility regarding the day-to-day running of the business, and subject to many of the same operational, workplace stresses as the SME owners. Therefore, aggregation is unlikely to influence the results of this study.

### **5.5.2 Strengths**

The strength of this study lies in providing the first estimates of absenteeism and presenteeism amongst SME owner/managers reporting high/very high psychological distress, the related inefficiency or lost productive time, and which work- and non-work-related variables are associated with these work attendance. To our knowledge no other study has attempted to address this within the SME sector despite the potentially costly health and economic implications, and doing so represents an important contribution to occupational health literature which has, to date, neglected the SME sector despite the sizeable contribution they make to most developed economies worldwide.

## **5.6 Conclusions**

This study identified associations between self-rated health and treatment and presenteeism amongst SME owner/managers that differed from those reported in non-SME populations. These findings identify targets for workplace mental health promotion or prevention strategies. The results suggest that workplace mental health promotion programs developed to reduce the incidence of sickness absence and continued work attendance, the number of absenteeism and presenteeism days reported, and the associated productivity loss in larger organisations may also be applicable within the small business setting. However, future research is required in order to explore the efficacy of applying existing programs to the SME sector.



## **5.7 Postscript**

The chapter outlines a study which used baseline data from an RCT evaluating a mental health promotion program for SME owner/managers to answer the research questions informed by the review conducted in Chapter 4. Specifically, a) what is the proportion of owner/managers reporting high/very high psychological distress; b) what are the correlates of absenteeism and presenteeism within this population; and c) what is associated lost productive time. Approximately 30% of owner/managers reported high/very high psychological distress, of which 90% reported past month presenteeism and significantly reduced productivity. However, no SME-specific factors were associated with presenteeism. This failure to identify any SME-specific correlates of presenteeism suggests that workplace mental health promotion programs designed to better manage depression and related work attendance behaviour in larger organisations may also be applicable in the SME sector. Further, the identified proportion of SME owner/managers reporting high psychological distress and continuing to work and the substantial lost productive time associated with this suggest that SMEs are a work setting in need of such programs. Future research should focus on developing, implementing and evaluating such strategies. In the next chapter (Chapter 6), focus is shifted from the correlates of presenteeism amongst individuals reporting depression to the health and economic consequences of continued work attendance behaviour.

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## **Chapter 6. Beyond dollar outcomes: Comparing the costs and health outcomes of depression-related work attendance behaviours.**

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### **6.1 Preface**

Previous chapters have focused on the predictors of depression related presenteeism. In this chapter we turn to exploring the consequence of presenteeism. **Chapter 1** of this thesis highlighted that data on whether the costs and health outcomes of sickness absenteeism and working while ill differ from the individual versus employer perspective is scarce. Existing theoretical models suggest the decision to be present or absent at work whilst experiencing a mental disorder determines who bears the associated costs. However, these costs have not been contrasted against potential health outcomes of either behaviour. Therefore, guidelines to inform optimal work attendance decisions for individuals experiencing depression are underdeveloped.

Therefore the study outlined in this chapter aimed to estimate and compare the cost and health outcomes of short-term absenteeism and presenteeism amongst employed Australians reporting lifetime major depression. It did this using cohort simulation using state-transition Markov models simulated movement between health states over one- and five-year time horizons according to probabilities derived from 2007 Australian National Survey of Mental Health and Wellbeing data and existing clinical literature. Findings could inform guidelines for clinicians and employers to better manage depression-related work attendance, and prompt the development of programs to encourage employees to continue working by adapting work environments and offering flexible work-time arrangements. Such programs may allow employers to utilise employees' remaining work ability, thus decreasing productivity loss.

The text that follows is included in a manuscript is in preparation.

## **6.2 Introduction**

The majority of employed individuals experiencing depression are able to continue working (1). For example, the 2007 Australian National Survey of Mental Health and Wellbeing revealed participation rates in any employment of 63.3% among individuals reporting lifetime major depression (2). However, depression can negatively impact work productivity through working time lost and via impaired work functioning and diminished at-work performance (3-5).

A large proportion of the economic cost of depression can be attributed to work impairment, disability(6), and lost productivity from sickness absence and individuals who continue to work when ill (presenteeism)(7). In fact, the at-work decrements due to depression and the subsequent lost productive time are more costly than absenteeism (1, 4, 8, 9). Specifically, 80% of depression-related lost productive time can be ascribed to presenteeism (7) which, worldwide, equates to annual costs of 18.2 billion USD (7), 15.1 billion UK pounds (10) and \$12.6 billion Australian dollars (11).

Although the financial costs of working with depression are increasingly recognised, the possibility that work attendance, or absence, behaviours could confer consequences beyond dollar outcomes has been largely overlooked in the literature(12). For example, sickness presenteeism has been associated with a 50% increase in incidence of serious coronary events compared to unhealthy employees with moderate levels of sickness absence (13) and predictive of poor self-rated health (14) and future sickness absence (15). However, potential benefits of presenteeism, including support from supervisors and colleagues or a maintained daily routine (16, 17), may outweigh negative health outcomes and the aforementioned economic costs. Therefore, the right balance between absenteeism and presenteeism for employees with depression is unknown and for employees seeking help, current psychiatric clinical practice guidelines provide inadequate assistance.

Management of depression amongst employed individuals could be optimised by a comprehensive, workplace-based approach incorporating prevention and health promotion, early identification and intervention, evidence-based disease and disability management and relapse prevention (18). Understanding the health and

economic outcomes of depression-related absenteeism and presenteeism behaviour is essential when designing and implementing such strategies (12, 19), particularly those focused on promotion and prevention. Such knowledge may reduce the burden of workplace depression by determining whether continuing to work when ill or taking a sickness absence is the optimal choice.

Exploration of consequences by occupation may determine whether recommendations should be tailored to different job types. Characteristics inherent in an employee's job can differ by job type and influence their attitudes to work attendance and their productivity or render them either unable or reluctant to take time off when sick. These differences could in turn influence absenteeism and presenteeism decisions and differentially affect the associated costs and health outcomes (3, 20). Studies found unskilled manual workers experiencing affective and anxiety disorders reported more total disability days (3, 21) and although mental health difficulties have been found to not affect work attendance amongst white-collar workers they significantly reduce their at-work performance (3). No study, to our knowledge, has synthesised the total costs and health outcomes for depression-related absenteeism compared to presenteeism behaviour or stratified these findings by occupation type.

This study employed cohort simulation methods to capture the potential costs and health outcomes of absenteeism and presenteeism amongst employed Australians reporting major depression and explored occupational variations (i.e. blue- vs. white-collar workers). In doing so it aimed to inform clinicians and employers what action is optimal for the individual, the employer, and society. Data may improve management of depression amongst employees by informing evidence-based investment in workplace health promotion and prevention strategies and future research aimed at preventing long-term work absences and associated costs, and facilitating a return to or maintenance of productive work activity (22).

### **6.3 Methods**

An epidemiologic-based analytic modelling study was conducted using cohort simulation (23, 24). Cohort simulation is used in health economics, and related clinical and epidemiological research, to model future costs and outcomes of

patients, groups or populations under alternative scenarios such as different treatment options (25). Cohort simulation, and other decision analysis techniques, synthesise best available evidence to answer questions that might not otherwise be readily answered. A wide range of evidence is usually included, such as epidemiologic surveys, meta-analyses, and high-quality single studies (26).

Cohort simulation was used in this study to model the alternate scenarios, work absence (absenteeism) versus work attendance (presenteeism), as the potentially harmful consequences of these actions are not fully understood. Therefore, random allocation of individuals to either situation is neither feasible nor ethical. Specifically, cohort simulation using a state-transition Markov models was employed to estimate the costs and health outcomes of working while experiencing depression versus taking a sickness absence. Two subsequent models determined whether these outcomes differed for blue- versus white-collar workers.

### 6.3.1 Analytic Structure and Time Horizon

Figure 6-1 (27) represents the state-transition Markov model used in this study. Three identically structured models were built using decision analysis software (Data TreeAge Pro: TreeAge, Williamstown, Mass) to evaluate the total costs and health outcomes of depression-related absenteeism versus presenteeism amongst: i) employed Australian adults; ii) white collar workers; iii) blue collar workers. For each of the models, a hypothetical cohort of employees (N=1000) occupied and moved between seven health states over time according to probabilities indicated by the arrows. Where relevant, states were assigned lost productive time, job turnover and health service use costs, and a utility value consistent with the depression diagnosis and treatment status of its occupants i.e. depressed or not depressed, in treatment or not in treatment. The number of people in each state, and time spent in it, determined the aggregate costs and health outcomes at the conclusion of the model. The 3-month cycle length chosen reflected the natural history of depression. The selected health states (Figure 6-1) are clinically relevant and informed by related research (27). Costs and health outcomes were considered from the societal perspective over a one-year time horizon. The models were extended to a 5-year time horizon to produce results more relevant to employers' decision-making time frames

i.e. those interested in improving outcomes for their current employees throughout their tenure.

### 6.3.2 Data Sources

Probabilities and costs within the models were derived from our primary, epidemiological data source, the National Survey of Mental Health and Wellbeing (2007), or published literature (Appendices B-D).

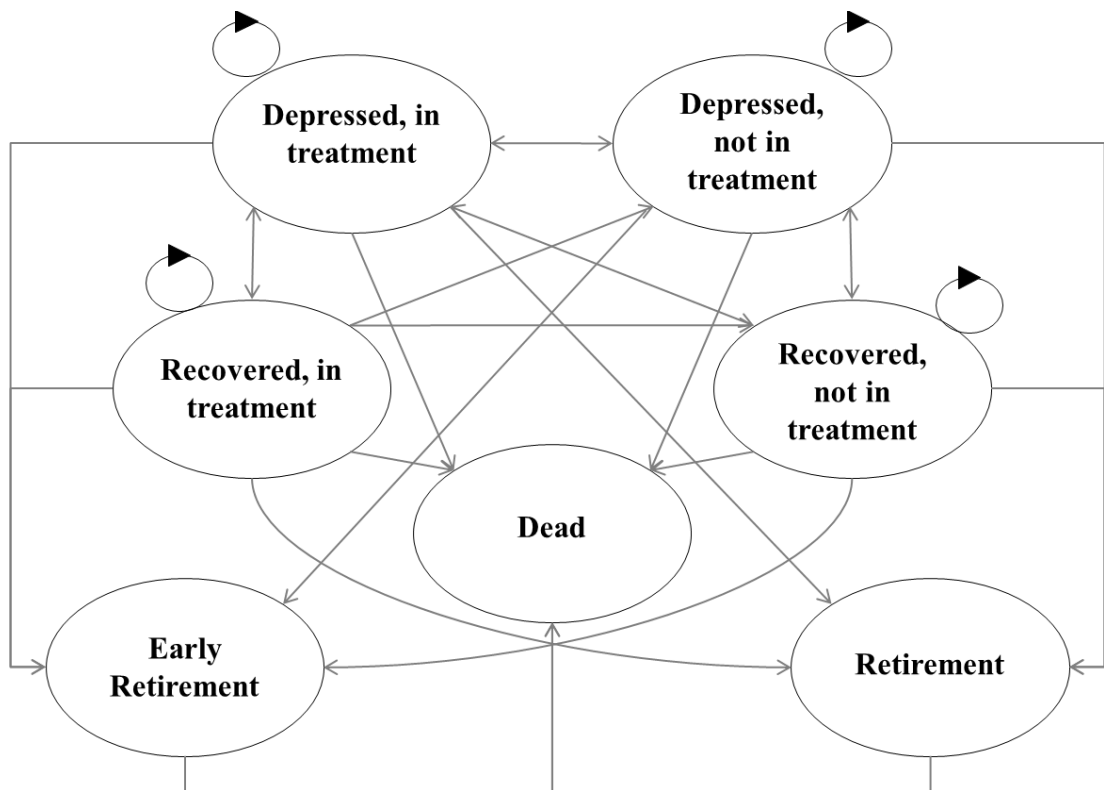
The 2007 National Survey of Mental Health and Wellbeing (NSMHWB) (2) is a stratified, random household survey conducted by the Australian Bureau of Statistics (ABS) between August and December 2007. Using the Composite International Diagnostic Interview (CIDI 3.0), it provided lifetime and 12-month prevalence estimates of anxiety, affective and substance use disorders within the Australian population. Information on impairment and severity associated with common mental disorders, related service use, physical conditions, social networks and care giving, and demographic and socio-economic characteristics was also collected. A response rate of 60% (N=8841), represented a projected Australian adult population of 16 015 300. Data are weighted to account for probability of an individual household's member being selected and to comply with the age and sex distribution of the Australian population. Weights were calibrated to population benchmarks for state by part of state (rural/urban), age and sex, state by household composition, state by educational attainment and state by labour force status.

The employment component of the NSMHWB, used to derive our blue and white-collar groups (occupation type), was based on the ABS monthly Labour Force Survey. The Australian and New Zealand Standard Classification of Occupation (ANZSCO) specified occupation type. Blue-collar encompassed tradespersons, machinery operators and drivers, and labourers. White-collar occupations were managers and administrators, professionals and para-professionals, administration and clerical staff, salespersons and community and personal service workers. Data from published studies determined the probability (28), and cost (29), of depression-related job turnover, mean presenteeism days (30) and absenteeism and presenteeism-related lost productive time costs (7, 31).

### 6.3.3 Initial Probabilities

Initial probabilities were derived from NSMHWB data (Appendices B-D) and used to distribute the cohort among health states (Figure 6-1). Depression-specific disability days reported were distributed between the absenteeism and presenteeism scenarios for each model. Absenteeism was defined as any reported days and presenteeism as no reported days. A depression-specific measure of disability days allowed the models to capture the costs and health outcomes of depression-specific absenteeism and presenteeism. It also eliminated the effect of co-morbid mental and physical disorders, which are common and potentially increase disability (32, 33).

Individuals were defined as ‘depressed’ if they reported 12-month depression symptoms or ‘recovered’ if they reported lifetime depression without 12-month symptoms. ‘In treatment’ referred to self-reported contact with a health professional for a mental health problem any time in the last 12-months (2). ‘Not in treatment’ was the converse. Individuals started the simulation process in a “depressed” or a “recovered” state (Figure 6-1).



**Figure 6-1.** State-transition Markov model diagram.

### 6.3.4 Transition Probabilities

Transition probabilities, applied in each successive cycle, governed the cohort's movement between health states throughout the model's duration (Appendices C-D). These differed according to occupation type (Appendix D). Estimates were derived from relevant secondary sources (27, 34-37) and transformed to reflect a 3-month time period when necessary. Transition probabilities included remission with and without treatment, represented as movement from a 'depressed' to a 'recovered' state, and relapse with and without treatment which determined the converse. Treatment initiation probabilities determined movement from a 'not in treatment' to an 'in treatment' state (27). Age- and sex- specific mortality/survival rates (38) determined the probability of moving to the 'dead' state. All depression states were associated with an increased mortality rate due to risk of suicide(34) and an increased risk of early retirement, before the age of 50 (39). Probabilities of retirement and early retirement were derived from ABS data (40, 41) and published sources (39) and governed movement into the relevant health states. The death and retirement health states are absorbing states, which individuals cannot leave once entered.

### 6.3.5 Costs

Costs assigned to each health state were estimated from the best available sources and based on the probability of various cost-incurring events being experienced, the number of times that event occurred, and the unit cost assigned to that event (Appendices B-D). Included costs were lost productive time, job turnover, depression-related service use and antidepressant medication costs. All costs were in 2007 Australian dollars (AUD), to reflect the reference year of our major, epidemiological data source.

Lost productive time costs involved multiplying the number of depression-specific absenteeism and presenteeism days, adjusted to a 3-month estimate, by the average daily wage derived from ABS Average Weekly Earnings estimates (42).

Absenteeism days for 'depressed' states were derived from the NSMHWB, whilst absenteeism days for 'recovered' states, and presenteeism days, were derived from published literature (30, 31) (Appendices B-D).



Depression-related job turnover costs included the cost of replacing an employee who is terminated or voluntarily leaves and recruitment, hiring and training costs. The study which provided the job turnover probability estimate, although deemed the best available source (43), used a sample considered unrepresentative of the general population and probabilities were restricted to 'depressed in treatment' states (28). The job turnover cost estimate was originally presented as a range, 0.75-1.5 times the worker's wage (44). Therefore, a uniform distribution was used to ensure every number within the specified range had the same probability of being selected (43), a recognised practice within Markov modelling studies (45).

The NSMHWB (2) provided depression-related health service use and antidepressant medication information. Information from respondents who reported depression as their main problem was used to adjust for co-morbidity (46). Number of contacts in the past year with general practitioners, psychologists, psychiatrists, mental health nurses and alternative therapists were costed using Medicare Benefits Schedule information. Reported 2-week antidepressant medication use was converted to 3-month probability estimates. As the type/s of antidepressant used and duration and dosage were unknown, prescriptions were costed for 3-months using the medication type (Selective Serotonin Reuptake Inhibitors) and dosage recommended under optimal care (47).

### 6.3.6 Health Outcomes

Quality-adjusted life years (QALYs), a combination of quality (measured using utilities) and duration of life, were the primary measure of health outcome; (Appendices B-D). Utilities are a global measure of the value attached to each health state and ideal to capture the broad effects on health and wellbeing possible from presenteeism and absenteeism (12, 13). The applicability of utility-weighted, population health outcomes to depression has been demonstrated (48) (49). Utilities were from the NSMHWB (2) which used the Assessment of Quality of Life-4D (AQoL-4D) (50), a validated measure, able to detect subtle quality-of-life differences in areas including mental health (51, 52).

### 6.3.7 Sensitivity Analysis

Univariate sensitivity analysis was performed by varying single-parameter values according to credible ranges, informed by existing literature, and re-running the model. Parameters selected for further investigation were those considered most likely to influence differences in cost.

A tornado diagram was used to explore parameter uncertainty in the model. This involved running a series of one-way sensitivity analyses combined in a single graph to identify parameters likely to considerably influence the expected value of the model. Parameters graphically represented by a wide horizontal bar contributed substantially to the model outcome i.e. total cost of absenteeism and presenteeism amongst blue- and white-collar workers. Influential parameters identified were probability and cost of job turnover, daily wage and annual salary.

Credible ranges for sensitivity analysis were derived from the literature. Daily wage, weekly wage and annual salary were replaced with identical values for blue- and white-collar workers to explore whether observed differences between the groups were due to white-collar worker's higher mean wage. Job turnover cost, which was represented in both models by a large range of 0.75-1.5 times a worker's annual salary, was widened further to represent the full range of estimates reported in the literature. Specifically, 0.5 times to 10 times a worker's annual salary (55-57). Job turnover probability for workers experiencing depression was increased from 10.5% to 25% and 50%, a realistic probability according to current estimates (58).

We also conducted Probabilistic Sensitivity Analysis (PSA) in which probability distributions were assigned to all cost and health variables and parameters in the models using their base-case estimates and 95% confidence intervals. Values for all model parameters were sampled from specified distributions (53). These were beta distributions for probabilities, gamma distributions for costs and uniform distributions when true functional form was unknown (Appendices B-D) as recommended by published guidelines for decision modelling in health economic evaluation (54). In each model, expected costs and health outcomes were calculated for a hypothetical cohort of 1000 workers. Re-sampling from each of the distributions and recalculating the costs and health outcomes from the model

generated a distribution of the estimated values. 95% confidence intervals were estimated from the simulated data to characterise the uncertainty of the cost and health outcomes (53). Costs and QALYs were both discounted at 3% (27, 37).

## 6.4 Results

Table 6-1 presents average costs and health outcomes for absenteeism and presenteeism over one-year with 95% uncertainty intervals. Outcomes are presented for the base case, and blue- and white-collar models.

### 6.4.1 Base Case Model

Total simulated cost of absenteeism over one-year was \$9626 per worker. Presenteeism cost an estimated \$7864 per worker, over one year (Table 6-1). All cost contributors, job turnover costs, lost productive time, antidepressant medication and service use, were higher for absenteeism reporters than presenteeism (Table 6-2). However, the only significant difference was for service use costs (Table 6-2).

Health outcomes did not significantly differ for absenteeism reporters (0.60 QALYs) relative to presenteeism reporters (0.68 QALYs), based on overlapping 95% confidence intervals (Table 6-1). Using overlapping confidence intervals to determine statistical significance is an appropriate method as evidenced by its employment in existing occupational and epidemiological research (59-61).

**Table 6-1** One-year cost and health outcomes of absenteeism and presenteeism.

	Absenteeism		Presenteeism	
	Estimate	95% Confidence Interval	Estimate	95% Confidence Interval
Base Case				
Cost (\$ AUD)	9626	6224 – 11 384	7864	4452 – 9565
QALYs	0.60	0.40 – 0.84	0.68	0.48 – 0.89
Blue Collar				
Cost (\$ AUD)	6223	4722 – 5997	5370	5589 – 6833
QALYs	0.57	0.51 – 0.60	0.65	0.58 – 0.66
White Collar				
Cost (\$ AUD)	12 938	11 442 – 14 416	11 178	9662 – 12 764
QALYs	0.54	0.49 – 0.56	0.66	0.60 – 0.71

Simulated costs and health outcomes for absenteeism and presenteeism over five years revealed differences observed between the two populations after one year remained consistent and were magnified over time. Total simulated cost of absenteeism over five-year was \$42 573 (95% CI: \$19 269-\$69 348) and \$37 791 (95% CI \$17 475-\$66 781) per worker reporting presenteeism. Five-year health outcomes did not significantly differ for absenteeism (2.70 QALYs) compared to presenteeism reporters (3.14 QALYs) based on overlapping 95% confidence intervals.

#### 6.4.2 Blue- and White-collar Models

Total simulated cost of absenteeism over one-year was \$6223 per blue-collar worker and \$12 938 per white-collar worker. Over one year, presenteeism costs an estimated \$5370 per blue-collar worker and \$11 178 per white-collar worker. Job turnover costs and lost productive time costs were significantly higher for white-collar workers than blue-collar workers (Table 6-2). Antidepressant medication and depression-related service use costs were significantly higher amongst white-collar workers (Table 6-2).

Blue-collar workers reporting absenteeism had better health outcomes (0.57 QALYs) compared to white-collar absenteeism reporters (0.54 QALYs). White-collar presenteeism reporters had slightly better health outcomes (0.66 QALYs) when compared to blue-collar presenteeism reporters (0.65 QALYs). These differences were not significant based on overlapping 95% confidence intervals (Table 6-1). However, white collar presenteeism reporters had significantly better quality of life (0.66 QALYs) compared to white collar workers who reported absenteeism (0.54 QALYs).

**Table 6-2** One year costs of absenteeism and presenteeism.

	Absenteeism		Presenteeism	
	Cost (\$ AUD)	95% CIs	Cost (\$ AUD)	95% CIs
<b>Base Case</b>				
Lost Productive Time	3095	1945 – 4457	2032	1308 – 2680
Job Turnover	6305	3633 – 7783	5692	2518 – 7358
Service Use	45	20 – 62	11	8 – 14
Antidepressants	179	124 – 172	128	112 – 153
Total	9626	6224 – 11 384	7864	4452 – 9565
<b>Blue Collar</b>				
Lost Productive Time	2738	2693 – 2741	1762	1731 - 1764
Job Turnover	3456	2899 – 4055	3586	2964 - 4173
Service Use	2	1 – 4	0.16	0.06 – 0.24
Antidepressants	36	7 – 46	20	6 - 45
Total	6223	6326 – 8048	5370	4522 - 5952
<b>White Collar</b>				
Lost Productive Time	4070	3995 – 4075	2198	2158 - 2201
Job Turnover	8745	7225 – 10138	8880	7330 – 10 431
Service Use	16	6 – 32	4	2 - 5
Antidepressants	106	104 – 106	87	85 - 88
Total	12 938	11 442 – 14 416	11 178	9662 – 12764

Differences in the simulated costs and health outcomes of absenteeism and presenteeism for blue- compared to white-collar workers over one year remained consistent and remained after five years. Total simulated cost of absenteeism over five-years was \$26 401 per blue-collar worker and \$63 771 per white-collar worker. Five year presenteeism costs were estimated at \$23 711 per blue-collar and \$54 709 per white-collar worker.

Health outcomes did not significantly differ for blue-collar workers reporting absenteeism (2.74 QALYs) compared to white-collar absenteeism reporters (2.64 QALYs) based on overlapping 95% confidence intervals. Nor did they differ for blue-collar presenteeism reporters (3.12 QALYs) when compared to white-collar presenteeism reporters (3.20 QALYs).

### 6.4.3 Sensitivity Analysis

Probabilistic sensitivity analysis revealed wide 95% confidence intervals around the cost of job turnover for blue-collar and white-collar workers by absenteeism and presenteeism for both time frames. For example, while the one-year point estimate for job turnover costs amongst white-collar presenteeism reporters was \$8880, it could range from \$7330 to \$10 431 (Table 6-2). This highlights both the importance of job turnover in terms of its contribution to the overall cost of the models and the need for a more robust estimate.

Results from the base case model revealed the one-year cost of absenteeism ranged from \$7376-\$46 273 per worker. In the occupation-specific models one-year cost of absenteeism ranged from \$5075-\$22 186 per blue-collar worker and \$9783-\$57 740 per white-collar worker. Over one year, base case presenteeism costs varied from an estimated \$5500-\$46 377. Further presenteeism costs ranged from an estimated \$4349 - \$19 864 per blue-collar worker and \$9783 - \$55 672 per white-collar worker.

Using a uniform daily wage and annual salary estimates revealed differences in cost outcomes between blue- and white-collar workers remained i.e. total cost was higher for white-collar workers. Varying cost of job turnover estimates for both workers with and without depression symptoms had the most substantial impact on total cost outcomes. Results revealed workplace accidents, when included make a substantial contribution. Specifically, workplace accidents cost absenteeism reporters \$121 710 (CI: \$106 179-\$148 448) per year and presenteeism reporters \$116 763 (CI: \$101 863-\$144 878) annually.

The inclusion of workplace accidents in the occupation-specific models resulted in estimated costs of \$95 128 (95% CI: \$82 989-\$118 034) per year for blue-collar absenteeism reporters and \$94 796 (95% CI: \$82 700-\$115 622) annually for blue-collar presenteeism reporters. Similarly, workplace accidents costs were valued at \$106 805 (95% CI: \$95 312-\$129 319) per year for white-collar absenteeism reporters and \$106 064 (95% CI: \$94 651-\$128 422) annually for white-collar presenteeism reporters. As predicted, cost outcomes were further magnified as the timeframe was increased from one to five-years.

**Table 6-3** Absenteeism and presenteeism cost outcomes of selected one-way sensitivity analysis over one-year.

		Base Case	
		Presenteeism	Absenteeism
		\$/QALY	\$/QALY
		7864	9626
Probability of Job Turnover	Alternative Parameters		
	Not Depressed		
	0.025		
Depressed	0.05	11 899	13 464
	0.075	12 627	13 530
	0.105		
Cost of Job Turnover	Not Depressed		
	512	5500	7376
	1154		
Depressed	11 615	46 377	46 271
	2080	7061	8634
	4685		
	47 318	20 997	25 674

## 6.5 Discussion

This study estimated and compared the cost and health outcomes of absenteeism and presenteeism amongst employees reporting lifetime major depression in the Australian population and determined whether outcomes differed for blue- versus white-collar workers. Base case absenteeism costs tended to be higher than presenteeism costs over one- and five-year time frames. However, these differences were non-significant, with the exception of service use costs. Significant differences were found between the cost outcomes of blue- versus white-collar workers. Employment related costs of lost productive time and job turnover and service use and antidepressant medication costs were all higher for white-collar workers. Health outcomes, as assessed in quality-adjusted life years also varied by occupation type:

white-collar workers reporting absenteeism had significantly poorer quality-of-life compared to blue-collar absenteeism reporters.

While tending to be lower than absenteeism costs, presenteeism costs were also substantial. Employees experiencing depression but who continue to work should also be considered in planning improved disease management and intervention programs to facilitate sustainable work functioning and prevent depression-related productivity loss. As employees reporting presenteeism may be milder depression cases, their work capacity is reduced not eliminated. Employers and health professionals could work concurrently to rearrange job tasks to suit their abilities (6), and provide flexible work attendance arrangements which allow employees to make the most of their work capacity whilst allowing time off when their productivity contributions are more severely affected. For example, a graded sickness absence approach could be considered that involves employees combining work and sickness absence i.e. working part-time, working full-time hours but performing modified tasks, or performing regular tasks with reduced input, whilst receiving a partial sick leave pay and partial salary (62).

Graded sickness absence has proven effective in keeping people with reduced work ability in work-life (62-64) and may have positive effects on health and well-being through the maintenance of their daily routines and providing a sense of purpose and opportunities for social support from co-workers. Recognition of the reduced capacity may also alleviate stress on the affected worker and promote better relationships with co-workers by enabling better planning on how tasks may need to be reallocated. To help ensure the efficacy of such programs, complementary efforts to reduce stigma associated with mental health issues are required as modifying duties or work-time arrangements may expose employees to the negative effects of stigma and exacerbate their condition (65).

Differences were observed between absenteeism reporters compared to presenteeism reporters *within* blue and white-collar groups. Individuals reporting absenteeism incurred significantly higher lost productive time, service use and antidepressant medication costs. Differences in lost productive time costs could be attributable to absenteeism reporters taking time off work due to more severe symptoms than presenteeism reporters who are able to continue working. More severe symptoms



amongst absenteeism reporters are likely to account for greater antidepressant medication and service use, and related costs, within the group. These findings suggest to employers and health professionals that absenteeism reporters should be the more immediate focus of any health promotion strategies implemented in the workplace.

Lost productive time was valued in the models on the basis of mean wage. Thus, wage differences between blue- and white-collar workers partly accounts for the differences by occupational type in overall costs. When a white-collar worker experiencing depression is absent or attends work whilst ill the ensuing productivity loss is greater as their time is valued more highly within the labour market than that of a blue-collar worker. Whilst sensitivity analyses revealed a higher mean wage does not entirely explain the observed differences it does explain the work-related differences and the remaining variability is societal costs. This highlights the relevance of these findings to managers and policy makers regarding the development of workplace intervention and promotion strategies tailored to specific occupation types. Employers of white-collar workers, particularly those with paid sick leave entitlements, may consider these results important as reducing depression-related absenteeism and presenteeism within this group would have significant cost-saving potential. However, as differences in wages explain the aforementioned differences in work-related costs, from a workplace perspective strategies designed to ameliorate depression-related absenteeism and presenteeism amongst blue-collar workers are equally important.

Service use and antidepressant medication costs per person were higher for white-collar than blue-collar workers. The sex distribution between occupation types in our sample may partly explain this difference. Women experiencing depression are significantly more likely to disclose symptoms and seek treatment, whether it is GP, psychologist or psychiatrist consultations or antidepressant medication (66-68). The NSMHWB found approximately 40% of women with a mental disorder reported service use compared to 28% of men (69). The increased likelihood for women experiencing depression to seek treatment, and the fact that 85% of females in our sample were white-collar workers, increased service related costs within the white-collar group. This is particularly relevant for managers and employers with a large proportion of female staff, such as those operating in the retail, education or health

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sectors. Awareness of the economic impact of depression within their workforce may encourage better illness and work attendance management. However, it must be noted that these are societal costs and workplace mental health support could have broader benefits beyond specific organisations or work settings. Therefore, the investment in the mental health and wellbeing of the workforce should be seen as priority for society in general as well as for employers.

Health outcomes also differed between occupation groups, suggesting depression and related work attendance behaviour affect blue and white-collar workers differently. White-collar absenteeism reporters experienced poorer quality-adjusted life years than their blue-collar counterparts and depression-related absenteeism and presenteeism costs were higher for white collar workers. This may inform the customisation, by occupation, of workplace health promotion amongst employees experiencing depression with the potential to improve illness and work attendance management.

The identified differences between blue and white-collar groups could also help managers and employers to plan more targeted efforts to reduce the adverse consequences of these behaviours amongst employees. Findings may help to identify areas of priority in regards to mental health promotion and prevention. In particular, the costs associated with absenteeism for white-collar workers, borne by employers by way of lost productive time and for employees in the form of service use and antidepressant medication costs, suggest they are an important focus of future workplace health promotion strategies with the potential to infer individual and societal benefits.

### 6.5.1 Limitations

Absenteeism reporters had lower QALYs, albeit not significantly, compared to presenteeism reporters. This may be due to individuals reporting absenteeism experiencing more severe symptoms which restrict their work ability and by extension their quality-of-life. However, what remains unclear is whether individuals reporting presenteeism have higher quality-adjusted life years due to benefits of continued work attendance such as social support, structured routine and income or whether continuing to work is due to higher quality-of-life. This highlights the need

for longitudinal data examining the impact of continued work attendance on not only Quality of Life amongst employed individuals reporting depression, but also whether any observed changes are as a result of their changes in the severity of their depression. With such data available, further exploration could take the form of analysis of absenteeism versus presenteeism costs and health outcomes stratified by severity of depression. Such analysis may allow recommendations as to whether continuing to work is advisable and whether absenteeism reporters should be encouraged to return to work as soon as possible. The inability to source each individual model inputs stratified by depression severity status precluded such an analysis being conducted and was one of this study's major limitations.

Further, job turnover was the largest contributor to overall cost of absenteeism and presenteeism but sensitivity analysis revealed both the probability and cost estimates for job turnover used in the model had substantial uncertainty around them; 95% confidence intervals were wide. Additionally, potentially relevant costs, including the cost of workplace accidents, were excluded due to inability to find strong, reliable estimate that met established quality of evidence criteria for decision analytic modelling (43). For example, the cost of workplace accidents was not included in our final model due to difficulty securing a reliable cost estimate, and sensitivity analysis which suggests the potential for total costs and occupation –specific costs of absenteeism and presenteeism to be considerably higher for both absenteeism and presenteeism following its inclusion. Future effort should be directed at understanding the magnitude of this problem.

### 6.5.2 Strengths

This study's most notable strength was the use of a quality epidemiological data source providing representative estimates of the Australian working population (2). This allows generalizability of our findings and facilitates their translation to all employed Australians; part time and full time employees from blue and white-collar occupations. Another strength is the major depression diagnoses used in the NSMHWB, determined using the modified version of the World Mental Health Survey Initiative version of the Composite International Diagnostic Interview (WMH-CIDI). This instrument has undergone extensive methodological testing and development which ensure the international comparability of our results (70).

Additionally, occupation type is an objectively measured variable which eliminates the potential for answers regarding working characteristics to be influenced by response style (acquiescence, social desirability), personality characteristics and negative affect (71); an important consideration within a sample of individuals experiencing depression (72).

## **6.6 Conclusion**

This study's findings have the potential to inform workplace health promotion and intervention strategies which benefit employees, employers and broader society via investment in a healthy and productive workforce. These results suggests that by informing employers and health care professionals of the health *and* economic outcomes of presenteeism for employees experiencing depression could encourage them to adapt work environments, allow employees to perform modified tasks, and offer flexible work time arrangements which promote continued work attendance (62). Benefits of such action may include decreased productivity loss, as employers use their employees' remaining work ability more effectively, and reduced turnover and employee replacement costs as employees with depression continue to be productive members of the workforce (62, 63, 64). Secondly, and of interest to health professionals, such workplace programs and modifications may have positive, long-term effects on health and well-being via the maintenance of a daily routine and co-worker support. Finally, the exploration of these outcomes by occupation type also allows their work attendance recommendations to be tailored to specific occupation types. Such information may be of particular importance for specific occupations or sectors with strong attendance demands such as small businesses, who lack the human capital to compensate for the lost productive time associated with sickness absence, or health care professionals with difficult to substitute skills. Improved management of depression and related work attendance behaviour, amongst white-collar workers in particular, could improve the health and work ability of employees to the benefit of employers via a more efficient workforce and for society in general by an economy strengthened by prevention-based investment in the health and productivity of the working population.

## **6.7 Postscript**

**Chapter 3** and **Chapter 5** concentrated on the correlates of work attendance behaviours amongst individuals reporting lifetime major depression and high psychological distress. This chapter switched focus to the other main area of presenteeism research; the health and economic consequences. In particular, it performed a systematic comparison of the health and economic consequences of absenteeism and presenteeism in response to the dearth of literature addressing depression-related presenteeism's potential health outcomes.

It found that absenteeism was more costly than presenteeism and conferred not additional health benefit. This information can be used as evidence for recommendations that employed individuals reporting depression should continue working. Further, it can be used as evidence to further the development of graded sickness absence programs which advocate keeping employees at work via modified work task and the working environment.

This chapter's focus on the health and economic outcomes of depression-related presenteeism complement the work reported in the next chapter (**Chapter 7**) which focuses on managers understanding absenteeism and presenteeism and the accurate valuation of related lost productive time.

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## **Chapter 7. Managerial understanding of presenteeism and its economic impact.**

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### **7.1 Preface**

The economic impact of ill-health in employed individuals is largely experienced via absenteeism- and presenteeism-related productivity loss. Using cognitive interviewing, this study evaluated a recently published interview method by which managers determine key job characteristics and their relationship to the cost of acute and chronic illness-related absenteeism and presenteeism in the workplace: the team production approach.

Improved understanding could enhance estimation of productivity loss recoverable via health management/promotion strategies and increase manager's willingness to implement such programs. Development in a manner acceptable to and informed by business leaders/employers ensures findings have "real-world" value.

The material presented here has been published in a peer-reviewed journal (1).

### **7.2 Introduction**

The economic impact of ill-health in employed individuals is experienced largely via indirect costs from absenteeism- and presenteeism-related lost productive time, where presenteeism denotes working while ill (2). Lost productive time contributes significantly to estimated costs or savings in appraisal of health-care programs, cost of illness studies or cost-benefit analysis (3, 4). Lost productivity is associated with both acute and chronic health conditions. Recent US estimates of annual productivity loss attributable to poor health were as high as 19.7% for workers at risk of back pain and 13.4% for those reporting impaired mental wellbeing (5). Therefore, its precise monetary valuation is vital.

There are two important steps to converting productivity into dollars. The first involves quantifying the amount of lost productivity, usually as a unit of time such as days lost. The second step involves the valuation of that lost time or assessment of

how much that it costs employers or the business. The present study is concerned with the second step, valuation.

### 7.2.1 Limitations of existing methods

Common approaches to valuing lost productive time are variants of salary conversion such as the human capital approach or friction cost methods (6). Human capital values sickness-related lost productive time as equivalent to the daily wage. Friction cost methods assume productivity costs occur only in the time it takes to replace an absent or unproductive worker and restore initial production levels (7). Both methods fail to account for the variability across jobs in how output is produced (8) and the value of that output. Valuing all employee's productivity equally and measurable in equal units may be inconsistent with actual output and performance indicators for each job type (9). For example, the applicability of these approaches to the modern labour market is disputed as the minority of workers perform discrete measurable tasks and few jobs are performed in isolation (8).

### 7.2.2 Key job characteristics and lost productive time: The team production approach

The team production interview (8, 10, 11), a newly developed method based on human capital, offers an alternate means of valuing absenteeism- and presenteeism-related lost productive time. Team production considers occupation specific job characteristics including whether jobs rely on teamwork, are difficult to replace at short notice or have time-sensitive output. Uniquely, the method relates the cost of productivity to specific jobs in specific settings and directly involves managers in the estimation of dollar cost. Manager engagement in the generation of economic impact may improve specificity of cost and increase the salience of evidence thus improving their perceptions of workplace health promotion and increasing their intention to invest in employee health (12).

The team production interview produces a league table of 'productivity cost multipliers' by occupation. The average daily wage is multiplied by an occupation-specific value, called a cost multiplier, to give a dollar amount for a lost productive

day, which reflects difference in replaceability, time sensitivity and team production between occupations. This approach suggests absenteeism- and presenteeism-related lost productive time costs for certain occupations may be substantially higher than those produced by standard human capital and friction costs methods (10). For example, the cost of a 3-day presenteeism episode for a cashier was estimated as close to the daily wage whereas estimated cost for an aerospace engineer was 142% greater than their daily wage (11).

### 7.2.3 Difficulty valuing presenteeism-related lost productive time

Absenteeism is a familiar concept and data is routinely collected by businesses. However, presenteeism is a comparatively new concept and more difficult to measure and value. The team production interview requires managers to think about the impact health conditions have on employee performance in terms of absenteeism *and* presenteeism. Difficulty valuing presenteeism-related lost productive time has produced a failure to actively manage health-related impairment of productivity while at work (11).

Difficulty quantifying presenteeism using self-report instruments and translating results into monetary outcomes is often attributed to a lack of confidence managers have regarding their understanding of the cognitively complex concept (11). Greater understanding of this uncertainty can be achieved through examination of the cognitive processes underlying survey response particularly when using the *four steps process model* (13). Clearly delineated steps include comprehension of the question; retrieval of the relevant information; application of said information to make a judgment if required and selecting and reporting an answer (13). Comprehension represents a critical stage as the respondent is required to understand the question before accurately answering it (14). Most difficulties regarding presenteeism measures arise during the comprehension stage due to ambiguity surrounding the concept's meaning.

Presenteeism measurement often requires respondents to combine pieces of information at their discretion requiring considerable cognitive effort and thus the potential to cause problems during the judgement phase of survey response (14).

Additional difficulties may arise when managers access their attitudes regarding the value of a particular employee or job type's work, necessitating the cognitively difficult task of assessing the relative importance of those beliefs and using them to form an overall judgment. Such difficulties are particularly evident amongst white collar professionals and knowledge-based professions without readily or objectively quantifiable work output (15) and employees engaged in a team production (10). Difficulties outlined may imply presenteeism cannot, in fact, be measured or valued using currently available self-report methods. Attempts to do so could produce systematic bias and misestimation of the impact of presenteeism within those difficult to assess knowledge-based occupations thus reducing the accuracy of attributed costs. Therefore, the development of a more salient, easily applicable and interpretable method is required.

#### **7.2.4 Benefits of instrument evaluation and improvement**

Evaluation and potential improvements in both accuracy and practicality of the team production interview may encourage managers use it more regularly to value absenteeism- and presenteeism-related lost productive time amongst their employees. In turn, accurate valuation could inform employers and relevant, health-care decision makers of the relative efficiency of different workplace health promotion strategies (16). As increased productivity may compensate for the cost of an intervention precise measurement of positive health and economic outcomes are likely to be of interest to employers and may prompt them to more readily adopt workplace health promotion strategies benefiting themselves and their employees (17). Societal gains are also likely as the economy is strengthened through prevention-based investment in the health and productivity of the working- age population (18).

Using cognitive interviewing techniques, this study aimed to evaluate the structure and content of the team production interview and its useability amongst managers. To our knowledge, this is the first evaluation of the cognitive processes underlying a cost valuation method. We explore the cognitive processes underlying manager's responses, identify difficulties and their causes and suggest design solutions to produce a more comprehensible measure of presenteeism and more reliable valuation of related lost productive time

## **7.3 Methods**

### **7.3.1 Sample and recruitment**

Twenty managers (12 women, 8 men) were recruited via invitations to postgraduate management students (n=6) and snowballing referral from those already enrolled (n=14). Eligibility was based on recent management experience, defined as: i) budget responsibility; ii) at least two supervisees; iii) Australian business experience; iv) occupation of a management role within the last year, for a minimum of 12 months. Most had occupied their current position for at least 2 years (M=9, SD=6.4). A variety of industries were represented and organisation size ranged from 3 to 24,000. Participation was voluntary and informed consent obtained. A sample of 20 is deemed adequate in cognitive interviewing for identifying major problems relating to survey design, structure, item interpretation and response (19).

### **7.3.2 Interview procedure**

The team production interview (8, 10, 11) and cognitive interviews were delivered concurrently in a telephone interview by a single interviewer (FC), to help ensure uniform delivery of interview items and reduce the potential for bias. The interviewer had a behavioural science background and interviewing experience. Sessions lasted, on average, 18 minutes with responses recorded by the interviewer throughout using pen and paper and word-processed immediately following the session's conclusion. The telephone based approach allowed a number of different managers to be reached in a relatively short period of time and encouraged manager's involvement by enabling participation outside work hours.

The same cognitive problems were consistently reported in the first 10 interviews after which no new themes were uncovered suggesting theoretical saturation had been achieved (20). Additional interviews ensured the difficulties identified received sufficient coverage and to obtain a diverse range of occupations.



### 7.3.3 Team production interview

The team production interview (8, 10, 11), available from authors upon request, contains five parts: general job descriptors collected information regarding a nominated job type including average daily net wage; key characteristics assessed the workers replaceability during absenteeism and presenteeism episodes, time sensitivity of their output and the degree of team-work using scales of 1 (least) to 5 (most); managers estimates of the impact of presenteeism on inputs contained two items measuring fewer productive hours (per 8-hours shift) a worker provided when attending work with a temporary acute, and a chronic condition; manager's categorical estimates of the impact of absence or presenteeism on output included three items separately assessing the impact of a 3-day absence and a presenteeism episode for both a temporary acute condition and a chronic condition, on the output of the sick worker's team using a scale of 1 (no impact) to 5 (total shutdown); scaling questions required managers to estimate the cost of a 3-day absence and a presenteeism episode for a temporary acute, and a chronic condition. Included costs related to lost productivity, covering for sick workers, negative impact on co-workers productivity, sales lost and expenses required to accommodate sick workers. Responses were expressed as percent of daily wage and/or dollar amount. Answers captured incremental costs beyond the lost marginal revenue product of the worker (11) and facilitate the translation of estimates into daily wage multipliers.

### 7.3.4 Cognitive interview

Concurrent verbal probing accompanied five presenteeism items previously identified as difficult for respondents (11). The interviewer followed participant responses by 'probing' the basis for their answer. Verbal probes aided the identification of comprehension and judgement difficulties and their proximity to the respondent's question answering experience reduced potential recall failure and fabricated explanations (21). Scripted general, probes ("How did you arrive at that answer?", "Was that easy or hard to answer?") were chosen to produce narrative responses for analysis and allow comparison of information across all respondents (19).

### **7.3.5 Analysis**

Cognitive interview responses, recorded by hand during the interview, were analysed using interpretative content analysis; the repeated examination of responses and the systematic identification of recurring messages or themes the frequency of which are counted (20). Counting units of analysis offers a rigorous, quasi-statistical form of qualitative analysis and allows the analyst to focus on all potential problems identified, cognitive or otherwise (19). Descriptive analysis examined manager's assessments of the key job characteristics to determine whether costs vary across job types (Table 7-2).

## **7.4 Results**

Cognitive interviewing responses revealed consistency in the difficulties reported. Issues identified were grouped according to three themes, which repeatedly emerged during analysis (Table 7-1):

- i. Misunderstanding of key concepts and terminology: misinterpretation of terms used in a question impeding the provision of a confident answer;
- ii. Inability to provide answers due to lack of knowledge: respondents were unable to draw on experience;
- iii. Difficulty applying questions/scenarios to their employee/workplace: the nature or structure of work done by selected job type or within their workplace/industry was not congruent with the question.

Table 7-1 presents examples of these themes, the items on which they arose and suggested modifications for future versions of this instrument.

**Table 7-1** Details and key themes emerging from cognitive interview analyses and suggested development of interview items classified by problem type.

Original Question	Details of problem identified during cognitive interviews	Proposed Action
<b>Misunderstanding of key concepts/terminology</b>		
Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a temporary acute condition?	Misunderstanding of “temporary acute condition” Definition of “temporary” unclear as evidenced by repeated reference to length of illness influencing the manager’s response	Provide definition of “temporary” as maximum of three days Provide examples of temporary acute conditions
	Misunderstanding of acute to mean severe	Provide a definition of “acute” and examples of temporary acute conditions
Original Question	Details of problem identified during cognitive interviews	Proposed Action
<b>Unable to respond accurately due to lack of knowledge</b>		
Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a chronic condition?	Unable to respond accurately due to lack of experience, to their knowledge, managing chronically ill workers	Add caveat: If you do not have prior experience managing chronically ill workers, please estimate to the best of your ability
Overall, how much do you think it costs the firm when a person comes to work with a temporary acute health condition for one day, compared to the situation when the person is not sick?	Managers not in direct service industries reported difficulties due to lack of easily quantifiable loss e.g. retail sales  Many admitted making an educated guess.	
Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?	Difficulties due to lack of experience managing chronically ill employees and inability to quantify lost productive time in terms of percent of wages or dollar amount	

**Table 7-1 cont.** Details and key themes emerging from cognitive interview analyses and suggested development of interview items classified by problem type.

Original Question	Details of problem identified during cognitive interviews	Proposed Action
<b>Difficulty applying questions/scenarios to their employee or workplace</b>		
On a scale of 1 to 5 how time sensitive is a workers output.	<p>Difficulty answering due to involvement in project work &amp; demands regarding achievement of critical goals. E.g. whether absenteeism/presenteeism occurred during production peak/trough</p> <p>Cyclical or seasonal variation amongst jobs was also influential. E.g. retail assistants experiencing increased time pressure during Christmas and New Year period</p>	Add new phrasing: “in a typical week”
Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?	Effects of lost productivity were identifiable but work completed/output produced by the majority of specified job types was not directly quantified or costed	
Original Question	Details of problem identified during cognitive interviews	Proposed Action
<b>Miscellaneous</b>		
Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a temporary acute condition?	<p>Dependent of whether the condition was contagious or not thus affecting other workers and team production</p> <p>These conditions are likely to be more affecting than chronic illnesses as they are often unexpected, symptoms are more peaked and employees have less experience managing them.</p>	
Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?	<p>Questions relating to chronic conditions require consideration of:</p> <ul style="list-style-type: none"> <li>• Whether conditions, and self-management practices, existed prior to employment</li> <li>• Whether the worker was experience a “flare up” of the condition</li> </ul>	
Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a chronic condition?		

Quantitative interview results revealed managers considered some occupations harder to replace in cases of absenteeism (M=3.7, S.d.=0.8) and presenteeism

(M=3.4, S.d.=1.0), more time sensitive (M=3.3, S.d.=1.1) and more reliant on team production (M=2.9, S.d.=0.9) (e.g. podiatrist) than others (e.g. store person) (Table 7-2). Consequently, greater productivity impacts in terms of worker input and output varied by job type. However, difficulty surrounding the evaluation of the productivity impact of chronic illness reduced the precision of these estimates.

**Table 7-2** Managers' estimates of replaceability: absenteeism and presenteeism, time sensitivity and team production.

Job Type	Industry <sup>a</sup>	Replaceability			
		Presenteeism Episode	Absence Episode	Time Sensitivity Estimate	Team Production Estimate
Retail Sales Assistant	Retail Trade	2	3	4	3
Hospitality Services	Other: Defense	2	2	4	3
HR Consultant	Education & Training	2	3	2	4
Recruitment Officer	Public Admin. & Safety	2	3	4	3
Podiatrist	Health Care/Social Assistance	2	5	5	4
Warehouse Storeman	Retail Trade	3	3	4	4
Retail Sales Assistant	Retail Trade	3	3	4	2
Community Pharmacist	Health Care/Social Assistance	3	3	3	2
Teacher	Education & Training	3	4	5	3
Assistant Manager	Retail Trade	4	4	1	1
Photographic Assistant	Education & Training	4	4	3	3
Staff Clerk	Public Admin. & Safety	4	4	3	4
Software Developer	Info, Media & Teleco.	4	4	2	4
Admin/Office Manager	Other – Trade Union	4	4	2	3
HR Consultant	Public Admin. & Safety	4	5	3	2
Industrial Officer	Education & Training	4	4	5	4
Dietician	Health Care/Social Assistance	4	3	2	2
Administration Officer	Other: Tas Cancer Registry	4	4	3	2
Disability Advocate	Health Care/Social Assistance	5	4	4	2
Manager Infrastructure	Public Admin. & Safety	5	5	3	3
Mean (Std. Dev)		3.4 (1.0)	3.7 (0.8)	3.3 (1.1)	2.9 (0.9)

## 7.5 Discussion

In Cognitive interviews with 20 experienced managers from various industries evaluated the team production interview designed to measure the consequences of acute and chronic illness-related absenteeism and presenteeism in the workplace. Using the cognitive interviewing approach allowed identification of difficulties manager's had quantifying and comprehending, in particular, presenteeism and

chronic illness items. The interview was modified in order to address the concerns of managers. These changes, although not considerable, aim to minimise potential measurement error in future applications of the instrument.

The issue most frequently identified by the cognitive interviews was manager's perceived lack of experience supervising employees with chronic illnesses. This led to difficulty determining the impact of chronic-illness on productivity. Managers reported the need to assume or estimate information regarding the type and severity of conditions and the potential consequences rather than provide assessments based on fact. Managers also reported the need to consider whether employees were experiencing an acute phase of their illness and how long they had been managing their condition to provide an accurate response. These findings advance those of the original study (8, 10, 11).

Reported lack of knowledge regarding chronic illness amongst employees and associated productivity consequences is potentially due to employee non-disclosure and limited organisational procedures that require organisations to monitor the prevalence of chronic illness (22). This lack of understanding has the potential to produce misperceptions of the impact of associated work loss and limits the interview's application to "visible" or disclosed conditions. Alternatively, managers' responses to chronic illness items may need to be backed up by additional interviews with employees experiencing these conditions.

Similar issues affect items estimating the impact of acute, temporary conditions albeit with a less detrimental effect on the response capability of managers. Resolution of this issue is difficult. Potential solutions such as including specific examples of conditions and severity levels may reduce the generalisability of the results and restrict their application to the example provided. That said, items addressing absenteeism were answered with relative ease, most likely due to familiarity with the concept and the methods employed to measure it (11).

Managers reported significant difficulty understanding and quantifying the impact of presenteeism for acute and chronic condition despite recognising its occurrence and demonstrating awareness of how working through illness could detrimentally affect

productivity. Those not in direct service industries found valuation of lost productive time costs difficult due to lack of easily quantifiable loss such as retail sales transacted. Misperceptions of presenteeism and difficulty quantifying related productivity loss also applied to knowledge based professions. This may explain why such job types are consistently ranked as more affected by continuing to work whilst ill (11, 15). A systematic bias may arise from the influence of endogenous attitudes regarding the importance of output amongst these types of workers combined with difficulties estimating the productivity consequences of presenteeism, encouraging managers to overestimate its impact.

Solutions to the problems identified within the team production interview were developed. However, evaluation of the instrument following their application is required to determine whether managers' comprehension of the troublesome items is improved. Evaluation will determine whether the problems identified limit the team production interview to use in conjunction with existing measures of health-related lost productive time. For example, difficulty estimating the impact of chronic illness, due to managers' reported lack of experience, may indicate questioning the employees with chronic health conditions is also necessary. Therefore, during future applications of the amended interview corresponding interviews with employees experiencing chronic conditions may be useful to determine the level of agreement with the responses of their managers and, by extension, the accuracy of the team production interview.

### 7.5.1 Limitations

Three methodological limitations are worthy of note. Firstly, interviewer bias can arise when investigators probe respondents for information not initially provided. Differential reactions to the interviewer's style can distort responses. However, the selection of fixed-word questions and open-ended, non-leading probes that employed "unbiased phrasing" (19) reduced the possibility of interviewer effects. Furthermore, the lone interviewer interjected minimally to ensure consistent presentation of interview items and cognitive probes.

Secondly and again relating to the interview process, improvements in manager's understanding of items and the accuracy of their responses may have been improved though the use of face-to-face rather than telephone based administration. Face-to-face interviews may have allowed observation of non-verbal cues, and provision of more natural type of interchange between the subject and the interviewer. However, telephone interviews helped ensure the time commitment required from managers was not onerous by negating the need for travel and encouraged participation by allowing completion of the interview outside regular work hours. Furthermore, a recent qualitative study comparing telephone and face-to-face interviewing revealed no significant differences between the results each method yielded (23).

Finally, interviews were not electronically recorded and full transcripts required to conduct content analysis using tailored qualitative analysis software (24) were unavailable. However, working from hand written notes recorded during interviews is a legitimate way to compile results conferring no discernible impairment in data quality (19). The non-laboratory style adopted during data collection and analysis phases of this study did not impede the primary aim of exploring underlying cognitive processes of interview responses to develop potential design solutions.

## **7.6 Conclusions**

In conclusion, novel application of cognitive interviewing to the team production interview allowed the identification of respondent difficulties and their causes by exploring the underlying cognitive processes managers employed during survey response. Of particular note is the need to improve manager's understanding of chronic illness and presenteeism to help ensure precise measurement and valuation of their impact in the workforce. Further development of this interview method is warranted and should occur in iterative sets involving rounds of questionnaire testing interspersed with revisions to determine whether the suggested modifications improve the instrument and reduce rates of problem identification (19).

Continued development of new tools and methodologies, such as the team production interview, to advance the measurement of ill-health related productivity loss in the workplace is essential. Of particular importance is the development of



measures in a manner acceptable to and informed by business leaders and employers to help ensure subsequent findings have easily applied, “real-world” value.

## **7.7 Postscript**

In this chapter, we highlighted the value of the newly developed Team Productive Interview. However, the cognitive interviewing also revealed significant issues with managers understanding of chronic illness and presenteeism, which is likely to diminish the accuracy of the cost estimates produced by the interview. Therefore, changes were recommended changes to potentially improve the instrument and recommend future testing of the instrument after implanting these changes to determine the level of improvement.

This completes the current series of studies that commenced by identifying the correlates of depression-related presenteeism in a population of employed Australian adults, proceeded to conduct a review of current literature to determine how depression and related work attendance may be experienced within SMEs, and tested a model informed by the research gaps identified in the review. It then went on to estimate and compare the costs and health outcomes of absenteeism versus presenteeism using cohort simulation and state-transition Markov models, and culminated in a study which evaluated a newly developed method for valuing presenteeism related lost productive time.

The final chapter (Chapter 8) contains a summary of the work within this thesis and the implications this may have for employed adults, experiencing depression. Areas for future research are also highlighted.

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## **Chapter 8. Discussion**

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This thesis aimed to:

- i. Determine the correlates of depression-related presenteeism in the Australian working population [Chapter 3], and within a sample of small-to-medium (SME) enterprise owner/managers reporting high/very high psychological distress [Chapters 4, 5];
- ii. Estimate the economic costs and health outcomes of depression-related absenteeism as compared to presenteeism within the Australian working population [Chapter 6];
- iii. Validate a newly developed method for valuing lost productive time due to acute- and chronic illness related absenteeism and presenteeism, and assess managers understanding of these concepts and their impact using cognitive interviewing techniques [Chapter 7].

### **8.1 Recap of Methods**

The data presented in this thesis were collected from three different sources. Firstly, the data used in the studies reported in **Chapter 3** and **Chapter 6** is from the 2007 National Survey of Mental Health and Wellbeing. This is a nationally representative household survey of 8841 adults aged 18-65, conducted by the Australian Bureau of Statistics between August and December 2007, and designed to collect information on the prevalence of selected 12-month and lifetime mental disorders within the Australian population.

The data used in **Chapter 5** was derived from the baseline phase of a randomised controlled trial set up to evaluate the effectiveness of a workplace mental health promotion program, Business in Mind. Business in Mind was designed to improve the mental health and wellbeing of small-to-medium enterprise (SME) owner/managers and baseline data from participating managers was collected by paper and electronic survey from October 2010 to May 2012. To be eligible to register to participate in the Business in Mind, owner/managers had to be in a current managerial position within a business employing less than 200 people and be over 18

years of age. A sample of 143 SME owner/managers were derived from this data, and analysed in **Chapter 5**.

Finally, the data used in **Chapter 7** were derived from a convenience sample of 20 managers. Of these managers, 12 were women, 8 were men, and they represented a variety of industries, and were from organisations ranging in size from 3 to 24,000. Eligibility was based on recent management experience, defined as: i) budget responsibility; ii) at least two supervisees; iii) Australian business experience; iv) occupation of a management role within the last year, for a minimum of 12 months. Most had occupied their current position for at least 2 years ( $M=9$ ,  $SD=6.4$ ). Participation was voluntary and informed consent obtained.

Two factors of distinct interest in this thesis were depression status and related work attendance behaviour, specifically presenteeism. Depression status was determined in different ways using different measures. **Chapter 3** and **Chapter 6** used a lifetime major depression diagnosis derived using the World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview, version 3.0 (WMH-CIDI 3.0). In **Chapter 5**, depression was indicated by high and very high scores on the Kessler 10 (K10) Psychological Distress Scale. Presenteeism was measured in all chapters using self-report measures. In **Chapter 3** and **Chapter 6** presenteeism referred to days worked whilst ill in the past year and was measured as the absence of absenteeism. Specifically, presenteeism was derived from answers to the survey item "In the 365 days, how many days were you totally unable to work or carry out your normal activities due to your depression". Those respondents who reported no depression-specific disability days were classified as presenteeism reporters. This method was selected as it provides a measure of depression-specific disability days and therefore removes the possible influence of co-morbid disorders of work attendance decisions. Presenteeism was also measured by self-report in **Chapter 5**.

## **8.2 Key findings and unique contribution to the literature**

### **8.2.1 Correlates of depression-related presenteeism in the Australian working population**

The study reported in Chapter 3 is the first, to our knowledge, to determine the relative importance of socio-demographic, financial, work and health-related factors associated with presenteeism amongst employees with depression. Further, it did so using a nationally representative sample of employed Australian adults reporting lifetime major depression derived from the quality epidemiological data source, the 2007 National Survey of Mental Health and Wellbeing. Findings revealed work and health factors had little influence on presenteeism behaviour over and above socio-demographic and financial factors. Factors identified as significantly associated with presenteeism were marital status, housing tenure and co-morbid mental disorders. Prior to this analysis which factors were associated with depression-specific presenteeism had not been established. These findings advance the literature by establishing which employees reporting depression may be more likely to exhibit presenteeism behaviour.

The finding that employed individuals reporting depression with no co-morbid mental disorders were more likely to report presenteeism indicates that presenteeism reporters may be milder cases of depression. This is supported by the discovery that the inclusion of severity during analysis reduced the independent effects of this factor. However, the inclusion of severity failed to significantly reduce the independent effect of marital status and housing tenure. This indicates that the effect of these two factors is not reflective of differences in health or depression severity and we are unable to use this explanatory framework to explore this finding. Therefore, future research is warranted to determine what aspects being married or owning a home prompts continued work attendance.

### **8.2.2 Psychological distress and related work attendance behaviour in small-to-medium enterprise owner managers**

The systematic review outlined in Chapter 4 was the first known attempt to collate information on the antecedents of psychological distress and depression in small-to-medium enterprise (SME) owner managers, and the associated absenteeism,

presenteeism and lost productive time. Findings revealed a dearth of SME-specific information that informed a research agenda designed to advance existing presenteeism literature by answering the following research questions: i) what is the proportion of SME owner/managers with high/very high psychological distress; ii) what is the proportion of SME owner/managers with high psychological distress reporting past-month sickness absenteeism, presenteeism and inefficiency days; iii) what is the associated, self-reported lost productivity, and iv) which work, non-work and SME-specific factors were associated with these work attendance behaviours. This prompted the first study of psychological distress and related work attendance behaviour amongst SME owner/managers (Chapter 5) and the first indication of what prompts work attendance decisions within this population.

In Chapter 5, it was demonstrated that the proportion of SME owner/managers with high/very high psychological distress was higher than in the working population of Australia (1) and SME owner/managers reporting high/very high psychological distress reported more past-month presenteeism days than absenteeism days. Findings also revealed that compared to owner/managers reporting low/moderate psychological distress, the productivity loss that occurs when owner/managers continue to work whilst reporting high/very high psychological was substantial. These findings are consistent with existing literature which suggests certain features of SME ownership and management including multiple roles and long work hours may increase their susceptibility to role ambiguity, overload, work/life imbalance, and financial pressure, and potentially their risk of job stress, and burnout (2), and depression (3-7). Findings also support literature that has identified lower absenteeism rates in smaller firms (8-14). However, this is the first study to provide estimates of absenteeism and presenteeism amongst SME owner/managers reporting high/very high psychological distress, the related lost productive time, and which work- and non-work-related variables are associated with these work attendance.

### 8.2.3 Economic costs and health outcomes of depression-related absenteeism versus presenteeism in the Australian working population

Chapter 6 revealed absenteeism produced slightly higher costs than presenteeism for one- and five-year time frames. When results were stratified by occupation type,

absenteeism costs exceeded presenteeism for blue- and white-collar workers. Employment-related costs, lost productive time and job turnover, and antidepressant medication and service use costs were significantly higher for white-collar workers. Health outcomes did not differ significantly in the base case or by occupation type. However, health outcomes did differ between absenteeism and presenteeism. These findings support previous studies which have established the significant economic cost of depression-related absenteeism and presenteeism (15-17). However it is the first, to our knowledge, to contrast these costs against potential health outcomes of either behaviour. Specifically, presenteeism research to date naturally stresses the monetary cost of continued work attendance but has thus far failed to acknowledge the importance of work, for health and wellbeing. Further, this study was the first to stratify these findings by occupation type (blue- vs. white-collar workers).

#### **8.2.4 Validation of the Team Production Interview**

In Chapter 7, cognitive interviewing techniques were used to validate the Team Production Interview and examine manager's understanding of the concepts of chronic illness and presenteeism. It was demonstrated that managers had difficulty understanding and quantifying chronic illness and presenteeism. These difficulties occurred as a result of a misunderstanding of the key concepts and terminology, an inability to provide answers due to lack of knowledge, and difficulty applying the questions and scenarios presented during the interview to their own employees or workplaces. This supports previous work that identified that managers have difficulty understanding the concept of presenteeism and assigning a value to subsequent lost productive time, particularly in knowledge based jobs without easily measureable output (13). However, we are the first to validate this instrument outside the original development team and the first use of cognitive interviewing to identify sources of response error in a productivity evaluation method via exploration of underlying cognitive processes.

### **8.3 Implications of findings**

This research has important implications regarding the management of depression and psychological distress, and the related work attendance behaviours in the



workplace. Although these studies were conducted using samples derived from the Australian working population, it is likely that the findings and subsequent implications may be relevant to occupational settings worldwide. They are as follows:

### **8.3.1 Presenteeism reporters are milder depression cases and ideal targets for early intervention**

Chapter 3 established that co-morbid mental disorders, and to a lesser degree, poor self-assessed mental health and more severe symptoms, were negatively associated with presenteeism. This suggests depressed employees reporting presenteeism tend to be the milder depression cases, and that their work capacity is reduced not eliminated. Therefore, these workers are prime candidates for improved disease management and intervention programs to facilitate sustainable work functioning and prevent depression-related productivity loss. For example, employers and health professionals could aim to maintain, and even improve, at-work performance by targeting areas employees are experiencing difficulty with and rearranging job tasks to suit their abilities (18). Flexible work attendance arrangements could be offered which allow employees to combine work and sickness absence. This may involve working part-time, working full-time hours but performing modified tasks, or performing regular tasks with reduced input whilst receiving a partial sickness benefit and partial salary (19). Existing research has shown graded sickness absence keeps individuals with reduced work ability in work-life (19-21) which may have positive effects on health and well-being through the maintenance of their daily routine and social support from co-workers. Benefits for employers include shorter absence periods (21) and faster returns to full time work (19).

### **8.3.2 Small-to-medium enterprises (SME) need improved strategies to manage and prevent psychological distress, related presenteeism and associated lost productive time.**

Chapter 4 identified a shortage of SME specific information regarding the experience of psychological distress, and the health and economic impact of associated absenteeism and presenteeism in this sector. The findings from Chapter 5, which revealed the large proportion of SME owner/managers reporting high/very high

psychological distress, the high prevalence of presenteeism within this population, and the substantial productivity loss associated with continued work attendance in this setting, confirm the need for improved management of mental health and wellbeing in SMEs. Further, we were able to identify factors that were significantly associated with presenteeism in this population; receiving treatment and better self-rated health. These findings support the conclusion drawn from the findings of Chapter 3 that presenteeism reporters are milder cases. Therefore, we suggest that early intervention and graded sickness absence programs that keep these individuals working may also work within the SME sector.

The findings of Chapters 4 and 5 also serve to highlight the value of the Business in Mind program. This position is further supported by a recent systematic review of the effect of Workplace Health Promotion (WHP) programs on reducing presenteeism which revealed involving supervisors and managers and improving supervisor/manager knowledge of mental health were common attributes of successful programs (23). Therefore, workplace mental health promotion programs, such Business in Mind, which are tailored to the SME sector and designed to improve owner/managers awareness of mental health issues, amongst themselves and their employees, are to be encouraged. However, follow up data is needed to provide longitudinal evidence of the effectiveness of the Business in Mind program to confirm this proposition.

### **8.3.3 Approaches that encourage employees reporting depression to continue working may be warranted.**

The comparison of the economic costs and health outcomes of absenteeism versus presenteeism in Chapter 6 represents the first occupation-specific cost evidence that can be used by clinicians, employees, and employers to review their management of depression-related work attendance. The finding that depression-related absenteeism costs more than presenteeism and offers no improvement in health supports recommendations that employed individuals experiencing depression should continue working, and aforementioned research which endorses flexible work-time arrangements and modification of work tasks to ensure individuals reporting depression can continue working. To help ensure the efficacy of such programs, complementary efforts to reduce stigma associated with mental health issues are

required as modifying duties or work-time arrangements may expose employees to the negative effects of stigma and exacerbate their condition (23).

One approach piloted in the UK, in response to Dame Carol Black's 2008 report, "Working for a Healthier Tomorrow" (24), which advocated changes to the sickness absence arrangements, is the provision of graded sickness absence certificates or 'fit notes' (25). This approach has also been successfully implemented in Scandinavian countries (19-21, 26) in an attempt to reduce absenteeism, and encourage continued work attendance and faster return to full duties following sickness absence. Fit notes are issued by General Practitioners (GPs) to employers, after consultation with the employee, focus on what the employee is still able to do, and endorse whether the employee could be fit to work with modified duties or hours. A GP would consider an employee "fit for work" if they were deemed able to return to work while they recover, with assistance from their employer. The GP may include comments and suggestions to help employers understand how they are affected by the employee's health condition and, if appropriate, may suggest ways for employers to aid the return to work.

This assistance employers provide may take several forms, each of which could be beneficial to an employee experiencing depression. For example, phased return to work, where employees may benefit from a gradual increase in work duties or working hours, may help an employee with depression maintain part of their daily routine and ensure continued social interaction. Altering an employee's hours to allow them the flexibility to start or leave later may be particularly beneficial for an employee experiencing depression who may experience difficulty starting a work day. Employers may amend an employee's work duties according to the degree of disability they are experiencing as a result of their depression. For example, an employee whose work involves psychical activity may be incapacitated by psychomotor retardation, a common symptom of depression, and require a temporary reprieve from having to complete those duties. Finally, an employer could make changes to the workplace which takes the employee's condition into account such as allowing more frequent breaks if they are finding concentrating for long periods difficult.

Graded sickness absence and the provision of “fit notes” has been lauded for assisting employees by providing advice and practical measures which ensure work remains compatible with their health and treatment, for assisting employers to determine how they could help an employee with a health condition remain in work, and for providing a means for GPs to improve their focus on the relationship between health and work. The finale point is particularly pertinent, given the strong evidence about the importance of quality work for health. Additionally, recent evidence from Norway revealed that graded sickness absence reduces the length and volume of long-term absence spells and significantly improves the likelihood that the absentees are employed in subsequent years (19-21).

There is scope for a similar approach to be trialled and implemented in Australia. However, a thorough investigation of how, and indeed if, such an approach could be translated to the Australian context is necessary. For example, despite the pilot form being well received by stakeholders and general practitioners, Norwegian researchers identified inflexible work arrangements and poor collaboration between stakeholders as potential impediments to the continued uptake of graded sickness absence strategies (19). Further, they reported that GPs not trained in occupational health felt uncertain about determining fitness for work. Therefore, any future Australian pilot would need to focus on whether employers and employees are prepared and willing to discuss the adjustments to working hours or duties recommended by the general practitioner, which workplaces and job types are receptive and amenable to such arrangements and which are not, and whether GPs require access to specialist occupational health advice or more support regarding decision making on work related medical problems. Further, when dealing with employees with depression, the effect of managers’ attitudes to employees with depression and their awareness of mental health would be important considerations (23). An awareness of these potential obstacles may help facilitate the implementation of such an approach in Australia.

#### 8.3.4 Further development of the Team Production Interview is needed to eliminate difficulties managers have understanding chronic illness and valuing related presenteeism.

Changes recommended aimed to minimise measurement error in future applications of the instrument and improve valuation of chronic illness and presenteeism in the workforce. Managers consistently reported lack of knowledge regarding chronic illness amongst employees and associated productivity consequences may produce misperceptions of the impact of associated work loss and limits the interview's application to "visible" or disclosed conditions. Therefore, managers' responses to chronic illness items may need to be backed up by additional interviews with employees experiencing these conditions. Improved understanding could enhance estimation of productivity loss recoverable via health management/promotion strategies and increase manager's willingness to implement such programs.

Employee interviews could then be used to determine the level of agreement with the responses of their managers and, by extension, the accuracy of the Team Production interview.

By providing owners, managers and employers with more accurate evidence regarding the cost of absenteeism and presenteeism related lost productive time and, conversely, the cost-saving potential of efficacious WHP programs may increase their likelihood of implementing such programs. The same might be said of improving their understanding and awareness of chronic illness, related work attendance behaviour, and involving them directly in the valuation of its economic. This would benefit not only owners, managers and employers, but also their employees, and society in general through the investment in a healthy productive workforce.

## **8.4 Limitations**

Despite the strength of the studies conducted in this thesis and the aforementioned implications regarding the management of depression, psychological distress, and the related work attendance behaviours in the workplace, their limitations must also be considered. For example, the analyses conducted in Chapter 3 were restricted to objectively measured work-related factors; work hours and occupation type.

Although desirable, the data source used did not contain the more detailed measures of job characteristics, psychosocial work environment factors, and modifiable factors such as work demands, resources (e.g., social support, security), tasks performed and workplace culture (e.g., supervisory behaviour, leadership style, organisational justice). Therefore there is a possibility that occupation fails to sufficiently control for the contributions of unmeasured job characteristics, leading to potential bias from the aforementioned, omitted variables.

A further limitation is the sole focus of the analyses in Chapter 3 on individual bivariate relationships between the dependent and independent variables i.e. socio demographic, work, financial, and health factors and depression-related presenteeism. Relationships *between* the independent variables were not considered. Therefore, we are unable to dismiss the possibility that variable choices may have been different if the relationships among the independent variables were considered. For example, we cannot rule out multi-collinearity, when two independent variables are highly correlated, thus making it difficult to assess their relative importance in determining an outcome or dependent variable. For example, if two independent variables were highly correlated and both were included in the model it would be difficult to determine which is having the most influence on the outcome variable and one or both may need to be excluded. A more in depth exploration of such relationships is recommended in future research in order to determine whether some variable choices were inappropriate or unnecessary.

The way in which presenteeism has been operationalized in Chapters 3 and 6 may be a potential limitation. Presenteeism was defined, using the NSMHWB depression module item “About how many days out of 365 in the past 12 months were you totally unable to work or carry out your normal activities because of your (sadness/or/discouragement/or/lack of interest)?”, as the absence of absenteeism. Therefore, the analyses within the aforementioned chapters were based two assumptions: i) that all employed individuals reporting 12-month depression experienced impairment relevant to work and, ii), the categories of 12-month absenteeism and presenteeism were mutually exclusive. Whilst the first assumption is reasonable given existing literature, summarised in this thesis, which consistently demonstrates the negative impact depression has on occupational functioning, the second assumption is not always correct. Recent research has identified that episodes

of absenteeism are often preceded and followed by episodes of presenteeism (27); a position reinforced by examination of the Business in Mind data which revealed almost 85% (n=47) of SME owner/managers reporting high/very high psychological distress reported post-month absenteeism *and* presenteeism days. This highlights that employed individuals reporting depression can experience both absenteeism and presenteeism within a given period of time.

This limitation is particularly relevant to the findings reported in Chapter 6 as the employed individuals who reported a depression-related sickness absence were excluded from the presenteeism group but may have in fact gone to work when ill at least one day in the past 12 months. Therefore the costs and health outcomes of presenteeism estimated in this analysis may in fact be undervalued. That said, while there was a NSMHWB item which asked respondents to report the number disability, or presenteeism, days they experienced in the past year, separate to an item which asked individuals to report their number of absence days, it was not depression specific. Therefore, although the choice to define presenteeism using the aforementioned NSMHWB item may be considered a limitation, it provided a measure of depression-specific disability days and therefore its selection removed the possible influence of co-morbid disorders of work attendance decisions.

The analyses in Chapter 5 are also potentially limited by the aggregation of SME owners and managers into one group. That is, differences between owners and managers in terms of personality traits or characteristics and their level of personal and financial involvement in the business have the potential to affect their probability of experiencing high/very high psychological distress and influence their work attendance decisions. For example, a SME manager may experience a sense of belonging and personal commitment to the business, driven by the small work terms and a close working relationship with the business owner, which may compel presenteeism. However, managers are less likely to see the business as an extension of their identity and potentially less motivated to continue working when sick to prevent business downturn or failure. Unlike owners, for whom owning and running their business is motivated by loyalty to a product and customers, personal growth, and the need to prove oneself as well as personal profit (28) and therefore may be more likely to report presenteeism. Further, owners may be more prone to presenteeism to prevent lost productive time due to sickness absence as they also

have a financial stake in the continued profitability and sustainability of the business. That said, 68 % of SME owner/managers in this study identified themselves the business owner, CEO or director. The remainder were senior managers, who reported a high level of responsibility regarding the day-to-day running of the business, and subject to many of the same operational, workplace stresses as the SME owners.

Finally, Chapters 4 and 5 highlight lower absenteeism rates within SMEs. Explanations considered included a sense of responsibility towards co-workers, multiple role responsibilities which render workers unable to compensate for the lost productivity of sick or absent colleagues, a strong connection to the company's wellbeing, the symbiotic relationship between individual and organisational performance, and pressure to attend work when ill as SME owner/managers' livelihood, and that of their family, is contingent on the continued viability and productivity of their business. Also considered was the possibility that absenteeism is higher in larger firms as they have back up human capital to compensate for absent workers. An alternative explanation to those already discussed, is that the prevalence of depression is lower amongst employees of SMEs. Although this may seem unlikely in light of the identified stressors to associated with owning/managing a SME that have been presented in this thesis, it is important to consider as that selection factors, such as personality traits which prompt an individual to start a business and maintain it successfully, may predispose them to a lower risk of depression. Therefore, despite the noted stress of owning/managing a SME the aforementioned selection factors may protect SME owner/managers to some extent meaning the prevalence of depression is the same as within the general working population. In conclusion, there is no available information to determine whether this alternative is plausible but it cannot be ruled out.

## **8.5 Recommendations for future research**

These areas for further research are listed below:

- Although **Chapter 3** identified that marital status, housing tenure and co-morbid mental disorders were associated with presenteeism behaviour amongst employed Australian adults reporting lifetime major depression, it remains unclear as to why these factors encourage continued work attendance. Therefore, these indicators cannot, as yet, be used by employers to establish a more effective protocol for managing depression-related work attendance. Future longitudinal prospective studies to explore the influence of



social cognitive variables, such as attitudes and subjective norms (22), and marital functioning and quality on employee work attendance behaviour may elucidate the relationship between marital status, home ownership and presenteeism.

- Based on the finding in **Chapters 3 and 6**, that presenteeism reporters had fewer co-morbid mental disorders and that absenteeism is more costly than presenteeism and confers no additional health benefit, we posit that individuals experiencing depression who continue to work are milder cases and should be the target of graded sickness absence programs. However, no study has investigated their effectiveness amongst a group of employed individuals reporting depression. Therefore, future research is needed to determine whether such an approach is beneficial amongst a group of depressed workers, and presenteeism should be measured as one of the key outcomes of interest.
- Further, the efficacy of graded sickness absence strategies has not been investigated in the context of the Australian workplace. Therefore, we recommend a pilot investigation involving, GPs, employers and employees, be conducted in order to identify the barriers and facilitators to successful implementation of such an approach and ultimately inform evidence-based guidelines for the aforementioned stakeholders.
- The findings of **Chapter 4** and **Chapter 5** highlight the need for further research in the SME sector. Although **Chapter 5** attempted to address the research questions proposed in response to the dearth of literature identified in **Chapter 4**'s review, findings could not be generalised to the broader SME population as the sample was not representative. Further, the research was only conducted amongst SME owner/managers therefore conclusions could not be drawn about employees with this sector, who make up the majority of the private sector workforce in most developed economies worldwide. Therefore, it is recommended that replicating the study conducted in **Chapter 5** using a population-based, nationally representative sample of SME owner/managers and employees is an important research priority.
- Based on the finding in **Chapter 5**, we suggest that early intervention and graded sickness absence programs that keep these individuals working may also be effective in the SME sector. However, before this can be endorsed future research to determine the efficacy of such programs within small

businesses, and whether specific modifications need to be made to improve their effectiveness in this sector, is recommended.

- The findings of **Chapter 6**, although informative, should be viewed as a starting point for future research into the health and economic consequences of depression-related presenteeism. Firstly, we were unable to identify a robust estimate of depression-related workplace accidents, a known cost of presenteeism, and recommend research be conducted to provide them for studies attempting to capture the cost of continued work attendance. Secondly, we used broad occupation categories which may not entirely capture the differences in health and economic outcome across job types and model which look at specific jobs for which presenteeism and depression prevalence is high, such as those within the health care sector, are recommended.
- Based on the findings of the study reported in the **Chapter 7**, we recommend further development of the Team Production Interview which should occur in iterative sets involving rounds of questionnaire testing interspersed with revisions to determine whether the suggested modifications improve the instrument and reduce rates of problem identification.

## 8.6 Summary and Conclusions

The cost of depression- and psychological distress-related presenteeism is substantial, and felt particularly keenly in small-to-medium enterprises (SMEs). However, this thesis revealed presenteeism reporters may be milder cases of depression, and may benefit from workplace mental health promotion programs, such as graded sickness absence, which offer flexible work arrangements that allow time off for treatment and recovery whilst maintaining work attendance and the potentially positive benefits of social support. Such measures would also allow employers to utilize the employee's remaining work ability and have been shown to reduce long-term sickness absence. This suggestion is supported by the finding that absenteeism is more costly than presenteeism and offers no additional health benefit over continuing to work. Further, as better self-rated health was significantly associated with presenteeism within SME owner/managers early intervention and graded sickness absence programs may also work within the SME sector. However,

more work is needed to establish whether such measures should be tailored to the SME setting and if so, how this should be done. Additional research is also required to identify whether graded sickness absence strategies can be translated from the UK and European context to Australian workplaces, and to evaluate the effectiveness of such an approach from the perspective of all key stakeholders i.e. general practitioners, employers and employees. Finally, developing the Team Production Interview in accordance with the recommendations outlined in this thesis, will improve manager's understanding of chronic illness and presenteeism to help ensure precise valuation of presenteeism-related lost productive time. Subsequently, accurate valuation could be used in combination with the findings of the aforementioned pilot study to inform employers and relevant, health-care decision makers of the relative efficiency of the aforementioned graded sickness absence strategies.

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## Appendix A: The Team Production Interview

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*These are the questions we will ask you in your upcoming telephone interview. It may be helpful to have these questions on hand when we call you. We are interested in your experience of how health problems affect the productivity of your staff – there are no right or wrong answers.*

### 1. Management experience:

1a. Do you have any management or supervisory experience? Yes No

*If yes:* Approximate total experience? \_\_\_\_\_ years \_\_\_\_\_ months

1b. Does your current position have management responsibility? Yes No

*If yes:* Approximate number of staff you are responsible for. \_\_\_\_\_

Approximate level of budget you control. \$ \_\_\_\_\_

Approximate length of time in position. \_\_\_\_\_ years \_\_\_\_\_ months

### 1c. Please indicate your current employment status:

Full-time Part-time / Contract Casual Not currently employed

### 1d. Please indicate which industry you work in:

Accommodation & Food Services	Manufacturing
Administrative & Support Services	Mining
Agriculture, Forestry & Fishing	Professional, Scientific & Technical
Arts & Recreation Services	Public Administration & Safety
Information, Media, Telco Services	Rental, Hiring & Real Estate
Construction	Retail Trade
Education & Training	Transport, Postal & Warehousing
Electricity, Gas, Water, Waste Services	Wholesale Trade
Financial & Insurance Services	Health Care & Social Assistance
Other _____	

### 1e. Please indicate the highest level of education you have completed.

Up to year 10	Associate Diploma/Certificate	Masters/MBA
Year 12	Graduate Diploma/Certificate	PhD
Trade Qualification	Undergraduate degree	Other _____

### 2. General job descriptors | Supervised Job Type)

2a. Job type/title: \_\_\_\_\_

2b. Number of employees of that job type that you supervise: | | | | |

2c. Total number of employees in your organisation in all jobs: | | | | |

2d. Average daily net wage of the relevant job type: \$| | | | |

2e. Average number of absence days per employee per year for this particular job type:  
| | | |

2f. Average number of scheduled working days per year: | | | |

[Prompt: For example, in a full time job, with four weeks annual leave, there are 240 scheduled work days per year not including flex time, public holidays].



### **3. Key characteristics**

*The next set of questions asks about the nature of the work done by [job type], and the implications for the productivity of your team if your [job type] is sick. We will ask you separately about what happens if they come into work when they are sick and what happens when they take a day off work.*

3a. On a scale of 1 to 5, how easy is it to have a co-worker or an outside temp worker pick up the most important responsibilities of the worker who is at work but sick, where:

1	2	3	4	5
Easy to pick up the responsibilities with similar quality				Impossible to pick up the responsibilities

*[Prompt: “1” means there is a pool of workers you can access whenever you want and these workers can take on the key tasks of the sick workers and perform them just as the sick worker would have if he/she had been healthy. “5” means there is nobody else you could possibly find who could take on the key tasks from the sick worker and do them just as well.]*

3b. On a scale of 1 to 5, how easy is it to have a co-worker or an outside temp worker pick up the most important responsibilities of the worker who is absent for the entire day because of illness, where:

1	2	3	4	5
Very easy				Not at all easy

3c. On a scale of 1 to 5, how time sensitive is this worker’s output, where:

1	2	3	4	5
Work can be postponed easily				Work cannot be postponed without severe consequences

*[Prompt: For example, “1” means that the worker can complete his or her work the following day and no sales are lost and no important deadlines are missed. “5” refers to a situation where sales would be lost and/or important deadlines missed if a worker were absent or present for work but sick.]*

3d. On a scale of 1 to 5, how important is this worker to the function of her/his team, where:

1	2	3	4	5
Team can function as usual when the worker is absent or present but sick				Team cannot function when the worker is absent or present but sick

*[Prompt: For example, a “1” might be appropriate for a person who picks crops in a field all by himself, and a “5” might be appropriate for the conductor of an orchestra where the orchestra can’t play without the conductor and the conductor is useless without the orchestra.]*

### **4. Managers’ estimates of impact of presenteeism episode on inputs**

4a. Now I want you to think of when your [job type] has a temporary acute condition such as a headache, cold/flu, or hay fever. Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hour shift does a [job type] provide if she/he has a temporary acute condition?

\_\_\_ hours

- 4b. Now think of when your [job type] has a chronic health condition such as asthma, diabetes, or depression. Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hour shift does a [job type] provide if she/he has a chronic condition?

\_\_\_ hours

**5. Managers' categorical estimates of the impact of absence/presenteeism on output**

- 5a. Consider a situation where a [job type] becomes unexpectedly ill and misses 3 days of work. On a scale of 1 to 5, what impact would this 3-day absence have on the output or work of the absent worker's team [or the other people the manager supervises if the ill worker does not work in a team]?

1	2	3	4	5
No effect at all				Total shutdown

- 5b. Now think about what happens to the overall productivity of the ill worker's team [or the other people the manager supervises if the ill worker does not work in a team] when one of the workers is at work with a temporary acute health condition. What impact would the presence of this sick worker have on the output or work of the sick worker's team [or the other people the manager supervises if the ill worker does not work in a team]? Please use a scale of 1-5.

1	2	3	4	5
No effect at all				Total shutdown

- 5c. Now think about what happens to the overall productivity of the ill worker's team [or the other people the manager supervises if the ill worker does not work in a team] when one of the workers is at work with a chronic health condition. What impact would the presence of this sick worker have on the output or work of the sick worker's team [or the other people the manager supervises if the ill worker does not work in a team]? Please use a scale of 1- 5.

1	2	3	4	5
No effect at all				Total shutdown

**6. Scaling questions**

- 6a. Earlier you said that these workers are paid about \$\_\_\_\_\_ per day. Overall, how much do you think a one day absence by this worker costs the firm, in terms of additional costs the firm incurs or sales lost due to the absence? Do not include any payments made to the absent worker. Please try to estimate, as best as you can, how much an absence of this type of worker costs the firm in terms of their daily wage.

% of daily wage \_\_\_ OR dollar amount \$ \_\_\_

- 6b. Earlier you said that these workers are paid about \$\_\_\_\_\_ per day. Overall, how much do you think it costs the firm when a person comes to work with a temporary acute health condition for one day, compared to the situation when the person is not sick? Costs include the value of the lost productivity, covering for the sick worker, any negative impact the illness has on the productivity of other workers you supervise, any sales lost due to reduced productivity, and any expenses to accommodate the worker's condition.

% of daily wage \_\_\_ OR dollar amount \$ \_\_\_

6c. Earlier you said that these workers are paid about \$\_\_\_\_\_ per day. Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick? Costs include the value of the lost productivity, covering for the sick worker, any negative impact the illness has on the productivity of other workers you supervise, any sales lost due to reduced productivity, and any expenses to accommodate the worker's condition.

% of daily wage |\_\_|\_\_|                      OR                      dollar amount \$ |\_\_|\_\_|

## Appendix B: Data assumptions and inputs in base case model

	Absenteeism		Presenteeism		
Variable/Parameter	Mean	Distribution/Range	Mean	Distribution/Range	Source
Initial Probabilities - Health States					
Depressed, treatment	0.208	0.202 - 0.214	†	†	NSMHWB*
Depressed, no treatment	0.167	0.162 - 0.172	†	†	NSMHWB
Recovered, treatment	0.107	0.104 - 0.110	†	†	NSMHWB
Recovered, no treatment	0.517	0.502 - 0.533	†	†	NSMHWB
Transition Probabilities					
Age	40.70	Normal ( $\alpha$ 40.7, $\sigma$ 12.76)	†	†	NSMHWB
Mortality	0.011	0.0003-0.078	†	†	<sup>69</sup>
Suicide, Depressed	0.0002	0.000202-0.000247	†	†	<sup>27</sup>
Treatment initiation – Depressed	0.19	Beta ( $\alpha$ 405.93, $\beta$ 1730.57)	0.0117	Beta ( $\alpha$ 9.86, $\beta$ 852.2)	<sup>27</sup>
Treatment drop out – Depressed	0.12	Beta ( $\alpha$ 17.81, $\beta$ 131.17)	†	†	<sup>27</sup>
Treatment drop out – Recovered	0.48	Beta ( $\alpha$ 70.95, $\beta$ 83.29)	†	†	<sup>27</sup>
Relapse – Recovered, treatment	0.12	Beta ( $\alpha$ 10.23, $\beta$ 73.95)	†	†	<sup>27</sup> , <sup>70</sup>
Relapse – Recovered, no treatment	0.25	Beta ( $\alpha$ 0.38, $\beta$ 1.09)	†	†	<sup>27</sup> , <sup>71</sup>
Remission – Treatment	0.55	Beta ( $\alpha$ 39.1, $\beta$ 31.83)	†	†	<sup>27</sup>
Remission – No treatment	0.13	Beta ( $\alpha$ 24.28, $\beta$ 154.76)	†	†	<sup>27</sup>
Miscellaneous Probabilities					
3-mo GP visits	0.085	Beta ( $\alpha$ 481.51, $\beta$ 5161.47)	0.047	Beta ( $\alpha$ 78.78, $\beta$ 1599.7)	NSMHWB
Depressed, treatment	0.067	Beta ( $\alpha$ 157.08, $\beta$ 2171.75)	0.037	Beta ( $\alpha$ 48.72, $\beta$ 1273.7)	NSMHWB
Depressed, no treatment	0.013	Beta ( $\alpha$ 119.12, $\beta$ 8602.1)	0.008	Beta ( $\alpha$ 96.9, $\beta$ 11919.9)	NSMHWB
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	
Early Retired	0.285	Beta ( $\alpha$ 265.2, $\beta$ 737.2)	0.118	Beta ( $\alpha$ 58.4, $\beta$ 437.7)	NSMHWB
Retired	0.356	Beta ( $\alpha$ 451.3, $\beta$ 827.9)	0.086	Beta ( $\alpha$ 481.51, $\beta$ 4761.47)	NSMHWB
3-mo psychiatrist visits	0.015	Beta ( $\alpha$ 359.57, $\beta$ 26274.93)	0.007	Beta ( $\alpha$ 114.39, $\beta$ 16164.11)	NSMHWB
Depressed, treatment	0.012	Beta ( $\alpha$ 505.65, $\beta$ 39492.85)	0.007	Beta ( $\alpha$ 114.39, $\beta$ 16164.11)	NSMHWB
Depressed, no treatment	§	§	§	§	NSMHWB
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	
Early Retired	0.062	Beta ( $\alpha$ 259.62, $\beta$ 3871.32)	0.026	Beta ( $\alpha$ 31.51, $\beta$ 1278.9)	NSMHWB
Retired	0.063	Beta ( $\alpha$ 263.72, $\beta$ 3869.24)	§	§	NSMHWB
3-mo psychologist visits	0.029	Beta ( $\alpha$ 1389.8, $\beta$ 44996.8)	0.0205	Beta ( $\alpha$ 998.7, $\beta$ 48898.4)	NSMHWB
Depressed, treatment	0.033	Beta ( $\alpha$ 1316.4, $\beta$ 38527.1)	0.0205	Beta ( $\alpha$ 998.7, $\beta$ 48898.4)	NSMHWB
Depressed, no treatment	§	§	§	§	NSMHWB
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	
Early Retired	0.062	Beta ( $\alpha$ 259.62, $\beta$ 3871.32)	0.071	Beta ( $\alpha$ 372.42, $\beta$ 4765.12)	NSMHWB
Retired	0.034	Beta ( $\alpha$ 1589.7, $\beta$ 43982.4)	§	§	NSMHWB

Number of consults					
General practitioner (GP)	2.5	Uniform (Low=1, High=4)	†	†	NSMHWB
Psychiatrist	2.5	Uniform (Low=1, High=4)	†	†	NSMHWB
Psychologist	9	Uniform (Low=6, High=12)	†	†	NSMHWB
3-mo antidepressant use					
Total	0.690	Beta ( $\alpha$ 166.2, $\beta$ 72.25)	0.325	Beta ( $\alpha$ 8.58, $\beta$ 17.93)	NSMHWB
Depressed, treatment	1.055	Normal ( $\sigma$ 0.072)	0.852	Beta ( $\alpha$ 78.26, $\beta$ 13.499)	NSMHWB
Depressed, no treatment	0.160	Beta ( $\alpha$ 444.6, $\beta$ 2283.0)	0.052	Beta ( $\alpha$ 320.37, $\beta$ 5840.63)	NSMHWB
Recovered, treatment	2.241	Normal ( $\sigma$ 0.094)	1.692	Normal ( $\sigma$ 0.084)	NSMHWB
Recovered, no treatment	0.348	Beta ( $\alpha$ 394.45, $\beta$ 739.03)	0.106	Beta ( $\alpha$ 567.89, $\beta$ 4739.5)	NSMHWB
Early Retired	1.23	Normal ( $\sigma$ 0.081)	§	§	NSMHWB
Retired	0.80	Beta ( $\alpha$ 216.81, $\beta$ 52.43)	1.41	Normal ( $\sigma$ 0.079)	NSMHWB
Job Turnover					
Depressed	0.104	Beta ( $\alpha$ 538.29, $\beta$ 4637.60)	†	†	28
Recovered	0.025	Beta ( $\alpha$ 1267.31, $\beta$ 48431.19)	†	†	28
Absenteeism Days					
Depressed, treatment	14.02	95% CI: 10.1 - 17.7	§	§	NSMHWB
Depressed, no treatment	5.5	95% CI: 3.0 - 8.3	§	§	NSMHWB
Recovered, treatment	1.6	95% CI: 0.1 - 2.7	§	§	NSMHWB
Recovered, no treatment	1.9	95% CI: 0.2 - 3.5	§	§	NSMHWB
Presenteeism Days					
Depressed, treatment	§	§	3.3	95% CI: 0.9 - 5.6	NSMHWB
Depressed, no treatment	§	§	4.2	95% CI: 1.1 - 7.7	NSMHWB
Recovered, treatment	§	§	1.7	95% CI: 0.6 - 2.8	NSMHWB
Recovered, no treatment	§	§	2.2	95% CI: 0.1 - 3.9	NSMHWB
Costs					
Daily Wage	176	149-202	†	†	72
Weekly Wage	880	Gamma ( $\alpha$ 8586.46, $\beta$ 9.75)	†	†	72
Annual Salary	39999.00	Gamma ( $\alpha$ 172.98, $\beta$ 0.0044)	†	†	72
Daily Hours	6.9	95% CI: 5.2 - 8.7	†	†	72
Weekly Hours	34.4	95% CI: 32.4 - 36.5	†	†	72
Lost Productive Time					
Depressed, treatment	2469	25% Range 1852 - 3087	573	25% Range 430 - 717	7, 31, 30
Depressed, no treatment	963	723 - 1205	736	553 - 921	7, 31, 30
Recovered, treatment	277	208 - 347	300	225 - 375	7, 31, 30
Recovered, no treatment	340	255 - 426	388	292 - 486	7, 31, 30
Job Turnover					
Depressed, treatment	4685	25% Range 3514 - 5857	†	†	28, 72
Depressed, no treatment	1154	866 - 1443	†	†	28, 72
Recovered, treatment	1154	866 - 1443	†	†	28, 72
Recovered, no treatment	1154	866 - 1443	†	†	28, 72
Service Use					
3-mo Antidepressant Use	52.33	44.5 - 60.2	24.63	20.9 - 28.3	NSMHWB, 47, 73
Depressed, treatment	79.96	68.0 - 92.0	64.59	54.9 - 74.3	
Depressed, no treatment	12.14	10.3 - 14.0	3.99	3.4 - 4.6	
Recovered, treatment	169.87	144.4 - 195.4	128.26	109.0 - 147.5	
Recovered, no treatment	26.42	22.5 - 30.4	8.09	6.9 - 9.3	
Early Retired	93.24	79.3 - 107.2	§	§	
Retired	60.8	51.7 - 69.9	107.43	91.3 - 123.5	
GP visit (>5 < 25 mins)	22.22	20.0 - 24.20	†	†	NSMHWB, 47, 73, 74, 75
Depressed, in treatment	4.52	3.8 - 5.2	1.66	1.4 - 1.9	
Depressed, no treatment	0.61	0.5 - 0.7	0.18	0.15 - 0.21	
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	
Early Retired	6.33	5.4 - 7.3	2.63	2.2 - 3.0	

Retired	7.92	6.7 - 9.1	1.92	1.6 - 2.2	NSMHWB, <sup>47</sup> , <sub>73, 74, 75</sub>
Psychiatrist visit (>30 <45 mins)	108.12	97.3 - 118.93	†	†	
Depressed, in treatment	3.46	2.94 - 3.98	2.05	1.74 - 2.36	
Depressed, no treatment	0.68	0.58 - 0.78	§	§	
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	NSMHWB, <sup>47</sup> , <sub>73, 74, 75</sub>
Early Retired	16.8	14.3 - 19.3	7.11	6.0 - 8.2	
Retired	16.9	14.4 - 19.5	§	§	
Psychologist visit (>60 mins)	181.54	163.38 - 199.69	†	†	
Depressed, in treatment	55.00	46.7 - 63.2	33.61	28.5 - 38.6	
Depressed, no treatment	§	§	§	§	NSMHWB
Recovered, treatment	§	§	§	§	
Recovered, no treatment	§	§	§	§	
Early Retired	101.95	86.6 - 117.2	116.36	98.9 - 133.8	
Retired	55.43	46.9 - 63.5	§	§	
Utilities – AQL <sup>a</sup> Values					
Depressed, treatment	0.116	Beta ( $\alpha$ 118.8, $\beta$ 905.6)	0.148	Beta ( $\alpha$ 110.3, $\beta$ 634.8)	
Depressed, no treatment	0.123	Beta ( $\alpha$ 163.6, $\beta$ 1167.0)	0.146	Beta ( $\alpha$ 107.5, $\beta$ 629.2)	
Recovered, treatment	0.133	Beta ( $\alpha$ 425.87, $\beta$ 2776.2)	0.170	Beta ( $\alpha$ 374.6, $\beta$ 1829.0)	
Recovered, no treatment	0.156	Beta ( $\alpha$ 2282.0, $\beta$ 12346.3)	0.186	Beta ( $\alpha$ 574.5, $\beta$ 2514.3)	
Early Retired	0.093	Beta ( $\alpha$ 68.7, $\beta$ 685.2)	0.114	Beta ( $\alpha$ 89.7, $\beta$ 705.3)	
Retired	0.224	Beta ( $\alpha$ 634.1, $\beta$ 2219.8)	0.214	Beta ( $\alpha$ 609.2, $\beta$ 2199.3)	
Discount rate	3%	0-5	†	†	27

\* National Survey of National Survey of Wellbeing (2007)

† Denotes the same value for each decision option.

‡ Assessment of Quality of Life-4D

§ No data available for this parameter from the NSMHWB e.g. no service or antidepressant use reported.

## Appendix C: Data inputs and assumption in absenteeism model

	White Collar		Blue Collar		
Variable/Parameter	Mean	Distribution OR Range	Mean	Distribution OR Range	Source
Initial Probabilities - Health States					
Depressed, treatment	0.195	0.176-0.215	0.242	0.219-0.267	NSMHWB*
Depressed, no treatment	0.159	0.143-0.175	0.2	0.180-0.220	NSMHWB
Recovered, treatment	0.116	0.105-0.128	0.076	0.069-0.084	NSMHWB
Recovered, no treatment	0.528	0.476-0.581	0.480	0.433-0.529	NSMHWB
Transition Probabilities					
Age	40.61	Normal ( $\alpha$ 40.61, $\sigma$ 12.70)	38.4	Normal ( $\alpha$ 38.4, $\sigma$ 12.95)	NSMHWB
Mortality	0.011	0.0003-0.078	†	†	<sup>69</sup>
Suicide, Depressed	0.0002	0.000202-0.000247	†	†	<sup>27</sup>
Treatment initiation - Depressed	0.19	Beta ( $\alpha$ 21.89, $\beta$ 92.31)	0.012	Beta ( $\alpha$ 0.6, $\beta$ 50.79)	<sup>27</sup>
Treatment drop out – Depressed	0.12	Beta ( $\alpha$ 17.81, $\beta$ 131.17)	†	†	<sup>27</sup>
Treatment drop out – Recovered	0.48	Beta ( $\alpha$ 13.75, $\beta$ 14.47)	†	†	<sup>27</sup>
Relapse – Recovered, treatment	0.12	0.015-0.085	†	†	<sup>27</sup> , <sup>70</sup>
Relapse – Recovered, no treatment	0.25	0.044-0.43	†	†	<sup>27</sup> , <sup>71</sup>
Remission – Treatment	0.55	0.47-0.62	†	†	<sup>27</sup>
Remission – No treatment	0.13	0.09-0.15	†	†	<sup>27</sup>
Miscellaneous Probabilities					
3-mo primary care physician visits	0.013	Beta ( $\alpha$ 0.64, $\beta$ 48.48)	0.015	Beta ( $\alpha$ 1.04, $\beta$ 68.23)	NSMHWB
3-mo psychiatrist visits	0.002	Beta ( $\alpha$ 0.04, $\beta$ 20.54)	0.002	Beta ( $\alpha$ 0.05, $\beta$ 18.28)	NSMHWB
3-mo psychologist visits	0.005	Beta ( $\alpha$ 0.13, $\beta$ 22.90)	0.007	Beta ( $\alpha$ 0.42, $\beta$ 57.10)	NSMHWB
Number of GP consults	2.5	Uniform (Low=1, High=4)	†	†	NSMHWB
Number of Psychiatrist consults	2.5	Uniform (Low=1, High=4)	†	†	NSMHWB
Number of Psychologist consults	9	Uniform (Low=6, High=12)	†	†	NSMHWB
3-mo antidepressant use					
Total	0.158	Beta ( $\alpha$ 7.53, $\beta$ 40.11)	0.147	Beta ( $\alpha$ 6.93, $\beta$ 40.11)	NSMHWB
Depressed, treatment	0.699	Beta ( $\alpha$ 11.46, $\beta$ 4.90)	0.221	Beta ( $\alpha$ 8.83, $\beta$ 31.24)	NSMHWB
Depressed, no treatment	0.128	Beta ( $\alpha$ 6.57, $\beta$ 44.79)	0.03	Beta ( $\alpha$ 1.01, $\beta$ 31.59)	NSMHWB
Recovered, treatment	4.605	Beta ( $\alpha$ -942.44, $\beta$ 737.56)	0.416	Beta ( $\alpha$ 4.39, $\beta$ 6.19)	NSMHWB
Recovered, no treatment	0.251	Beta ( $\alpha$ 21.89, $\beta$ 65.31)	0.04	Beta ( $\alpha$ 1.29, $\beta$ 30.54)	NSMHWB
Costs					
Daily Wage	215.18	Gamma ( $\alpha$ 65.8, $\beta$ 0.31)	170.20	Gamma ( $\alpha$ 39.6, $\beta$ 0.23)	<sup>72</sup>
Weekly Wage	1075.88	Gamma ( $\alpha$ 8886.46, $\beta$ 8.25)	851.00	Gamma ( $\alpha$ 8586.46, $\beta$ 10.05)	<sup>72</sup>
Annual Salary	55945.50	Gamma ( $\alpha$ 218.48, $\beta$ 0.0039)	44252.50	Gamma ( $\alpha$ 187.08, $\beta$ 0.0042)	<sup>72</sup>
Daily Hours	7.7	95% CI: 7.57-14.9	7.8	95% CI: 7.56-8.03	<sup>72</sup>
Weekly Hours	38.4	95% CI: 37.2-39.6	38.9	95% CI: 37.8-40.1	<sup>72</sup>

Lost Productive Time					
Depressed, treatment	3066.32	2759.70-3373.0	2426.20	2183.58-2668.82	7 <sup>31</sup> 30
Depressed, no treatment	1441.70	1297.5-1585.9	881.21	793.08-969.33	7 <sup>31</sup> 30
Recovered, treatment	338.90	305.0-375.8	251.05	225.94-276.15	7 <sup>31</sup> 30
Recovered, no treatment	416.18	374.6-457.8	312.16	280.94-343.37	7 <sup>31</sup> 30
Job Turnover					
Depressed, treatment	6553.64	5898.28-7209.00	5183.88	4665.49-5702.27	28 <sup>72</sup>
Depressed, no treatment	1614.16	1452.74-1775.58	502.88	419.45-512.67	28 <sup>72</sup>
Recovered, treatment	1614.16	1452.74-1775.58	502.88	419.45-512.67	28 <sup>72</sup>
Recovered, no treatment	1614.16	1452.74-1775.58	502.88	419.45-512.67	28 <sup>72</sup>
Service Use					
3-mo Antidepressant Use	25.26	22.70-27.80			NSMHWB, 47 <sup>73</sup>
Depressed, treatment	52.97	47.7-58.63	16.81	15.13-18.49	
Depressed, no treatment	9.70	8.7-10.7	2.29	2.06-2.52	
Recovered, treatment	75.78	68.2-83.36	31.56	28.40-34.72	
Recovered, no treatment	19.03	17.1-20.9	3.06	2.75-3.37	
Primary care physician visit (>5 < 25 mins)	22.22	20.0-24.20	†	†	NSMHWB, 47 <sup>73</sup> 74, 75
Depressed, in treatment	0.697	0.627-0.767	0.68	0.61-75	
Depressed, no treatment	0.101	0.091-0.111	0.13	0.12-14	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Psychiatrist visit (>30 <45 mins)	108.12	97.3-118.93	†	†	NSMHWB, 47 <sup>73</sup> 74, 75
Depressed, in treatment	0.747	0.672-0.822	0.37	0.33-0.41	
Depressed, no treatment	0	§	0.36	0.33-0.41	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Psychologist visit (>60 mins)	181.54	163.38-199.69	†	†	NSMHWB, 47 <sup>73</sup> 74, 75
Depressed, in treatment	8.66	7.79-9.53	3.34	3.01-3.67	
Depressed, no treatment	0	§	0	§	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Total Service Use	11.33	10.2-12.46	4.89	4.40-5.38	
Depressed, in treatment	10.11	9.09-11.12	4.39	3.95-4.83	
Depressed, no treatment	0.101	0.091-0.111	0.51	0.46-0.56	
Recovered, treatment	0		0	§	
Recovered, no treatment	0		0	§	
Utilities – AqoL-4D Values ‡					
Depressed, treatment	0.1180	Beta (α 56.91, β 425.40) 95% CI: 0.089-0.1468	0.1108	Beta (α 31.29, β 251.15) 95% CI: 0.0743-0.1473	NSMHWB
Depressed, no treatment	0.1230	Beta (α 271.25, β 1933.73) 95% CI: 0.1093-0.1367	0.1219	Beta (α 17.22, β 124.02) 95% CI: 0.068-0.1757	NSMHWB
Recovered, treatment	0.1221	Beta (α 306.74, β 2204.20) 95% CI: 0.1094-0.1350	0.1102	Beta (α 8.41, β 67.92) 95% CI: 0.0404-0.1800	NSMHWB
Recovered, no treatment	0.1499	Beta (α 1471.36, β 8342.99) 95% CI: 0.1429-0.1570	0.1725	Beta (α 529.83, β 2541.63) 95% CI: 0.1591-0.1858	NSMHWB
Discount rate	3%	0-5	†	†	27

\* National Survey of National Survey of Wellbeing (2007)

† Denotes the same value for each decision option.

‡ Assessment of Quality of Life-4D

§ No data available for this parameter from the 2007 NSMHWB e.g.no service or antidepressant use reported.



## Appendix D: Data inputs and assumptions in presenteeism model, where estimates differ from absenteeism model.

Variable/Parameter	Mean	Distribution/Range	Mean	Distribution/Range	Source
<b>Miscellaneous Probabilities</b>					
3-mo primary care physician visits	0.007	Beta ( $\alpha$ 0.37, $\beta$ 49.30)	0.008	Beta ( $\alpha$ 0.53, $\beta$ 62.11)	NSMHWB*
3-mo psychiatrist visits	0.0015	Beta ( $\alpha$ 0.015, $\beta$ 9.87)	§	§	NSMHWB
3-mo psychologist visits	0.0045	Beta ( $\alpha$ 0.17, $\beta$ 36.39)	§	§	NSMHWB
3-mo antidepressant use					
Total	0.239	Beta ( $\alpha$ 8.28, $\beta$ 9.93)	0.069	Beta ( $\alpha$ 11.55, $\beta$ 62.75)	NSMHWB
Depressed, treatment	0.431	Beta ( $\alpha$ 0.017, $\beta$ 36.39)	0.332	Beta ( $\alpha$ 5.38, $\beta$ 10.83)	NSMHWB
Depressed, no treatment	§	§	§	§	NSMHWB
Recovered, treatment	1.0	Beta ( $\alpha$ 429.57, $\beta$ 3.56)	0.208	Beta ( $\alpha$ 2.46, $\beta$ 8.54)	NSMHWB
Recovered, no treatment	0.087	Beta ( $\alpha$ 4.84, $\beta$ 50.74)	0.014	Beta ( $\alpha$ 0.97, $\beta$ 52.75)	NSMHWB
<b>Lost Productive Time</b>					
Depressed, treatment	738.12	664.3-811.9	490.04	441.04-539.04	7, 31, 30
Depressed, no treatment	938.28	844.5-1032.1	630.05	567.05-693.06	7, 31, 30
Recovered, treatment	367.00	330.3-403.7	256.71	231.04-282.38	7, 31, 30
Recovered, no treatment	475.40	427.9-522.9	332.52	299.27-365.77	7, 31, 30
<b>Service Use</b>					
3-mo Antidepressant Use	18.17	10.36-19.99	5.24	4.72-5.76	NSMHWB, 47, 73
Depressed, treatment	32.68	29.4-35.9	25.17	22.65-27.69	
Depressed, no treatment	§	§	§	§	
Recovered, treatment	75.78	62.20-83.36	15.80	14.22-17.38	
Recovered, no treatment	6.67	6.0-7.3	1.06	0.95-1.17	
Primary care physician visit (>5 < 25 mins)					NSMHWB, 47, 73, 74, 75
Depressed, in treatment	0.247	0.222-0.272	0.47	0.42-52	
Depressed, no treatment	0.039	0.035-0.043	0	0	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Psychiatrist visit (>30 <45 mins)					NSMHWB, 47, 73, 74, 75
Depressed, in treatment	0.406	0.365-0.447	0	§	
Depressed, no treatment	0	§	0	§	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Psychologist visit (>60 mins)					NSMHWB, 47, 73, 74, 75
Depressed, in treatment	7.41	6.66-8.15	0	§	
Depressed, no treatment	0	§	0	§	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
Total Service Use	8.11	7.29-8.92	0.47	0.42-0.52	
Depressed, in treatment	8.07	7.26-8.87	0.47	0.42-0.52	
Depressed, no treatment	0.039	0.035-0.043	0	§	
Recovered, treatment	0	§	0	§	
Recovered, no treatment	0	§	0	§	
<b>Utilities – AqoL-4D Values<sup>‡</sup></b>					
Depressed, treatment	0.1412	Beta ( $\alpha$ 35.97, $\beta$ 218.69) 95% CI: 0.098-0.1840	0.1565	Beta ( $\alpha$ 372.74, $\beta$ 2008.96) 95% CI: 0.1420-0.1711	NSMHWB

## Appendices

Depressed, no treatment	0.1501	Beta ( $\alpha$ 94.39, $\beta$ 534.44) 95% CI: 0.1222-0.1780	0.1378	Beta ( $\alpha$ 40.70, $\beta$ 254.69) 95% CI: 0.098-0.1771	NSMHWB
Recovered, treatment	0.1656	Beta ( $\alpha$ 291.51, $\beta$ 1468.79) 95% CI: 0.1482-0.1830	0.1558	Beta ( $\alpha$ 7.94, $\beta$ 43.04) 95% CI: 0.0571-0.2544	NSMHWB
Recovered, no treatment	0.1835	Beta ( $\alpha$ 1413.0, $\beta$ 6286.34) 95% CI: 0.1749-0.1922	0.1948	Beta ( $\alpha$ 840.15, $\beta$ 3472.74) 95% CI: 0.1830-0.2066	NSMHWB

\* National Survey of National Survey of Wellbeing (2007)

† Denotes the same value for each decision option.

‡ Assessment of Quality of Life-4D

§ No data available for this parameter from the 2007 NSMHWB e.g. no service or antidepressant use reported.